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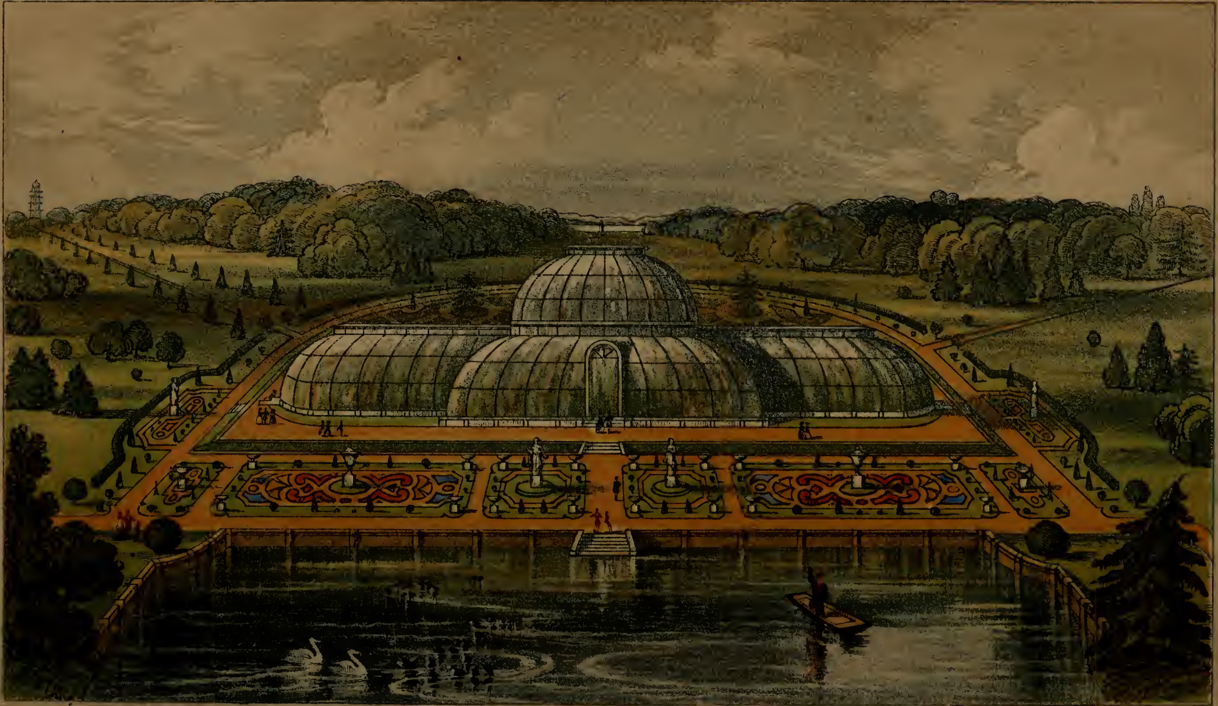

J. R. Jobbins.

THE GREAT CONSERVATORY AND GROUNDS AT KEW.

LONDON

EXHIBITED

IN

1851;

ELUCIDATING ITS NATURAL AND PHYSICAL CHARACTERISTICS
ITS ANTIQUITY AND ARCHITECTURE;
ITS ARTS, MANUFACTURES, TRADE, AND ORGANIZATION;
ITS SOCIAL, LITERARY, AND SCIENTIFIC INSTITUTIONS;
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AND OTHERS;
INCLUDING A NEWLY-CONSTRUCTED MAP,
ENGRAVED BY MR. WILSON LOWRY.

EDITED AND PUBLISHED BY
JOHN WEALE.

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Before bringing this work to a conclusion, the Editor fe called upon to express his deep obligations to the many gen tlemen and heads of departments who have favored him with the assistance.

In the compilation of a work so extensive and so [illegible] imperfec tions will necessarily appear, and for these the Editor asks th candid indulgence of the public, while he thanks [illegible] their co-operation for the remedy of any errors which may have escaped his at and for the communication of any suggestions which may furthe improve the work.

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LONDON AND ITS VICINITY.

LONDON is the largest and wealthiest, as well as the most populous of the cities of the world. It is at once the centre of liberty, the seat of a great imperial government, and the metropolis of that great race whose industry and practical application of the arts of peace are felt in every clime, while they exert an almost boundless influence over the moral and political destinies of the world. About to become the theatre of an event of the highest moral importance, it is desirable that the stranger in our giant city should be made acquainted with its organization and structure—with its trade and commerce—with the sources of its social and political greatness—with its many treasures hidden from the eye of the superficial observer. The aim of the present volume is to endeavour to effect this object—and in such a manner as not only to satisfy the mind of the learned and scientific inquirer, but to afford to the man of business and the sight-seer the advantages of a book of reference to those numerous depositories of art and science which abound in the metropolis, and which render such effectual aid towards the refinement of domestic life, by furnishing alike the means of instruction and amusement. The work—which is accompanied by a map scientifically laid down from the meridian of St. Paul's—will be found to contain valuable information on the following subjects:—

Almshouses.
Architecture of London, ancient and modern.
Architects: the great men, Jones, Wren, and Chambers, who have contributed most to the architecture of London.
Arts, Manufactures, and Trades.
Assurances.
Asylums.
Banks—Bank of England.
Baths and Washhouses.
Botanical Features and Landscape of the Neighbourhood of London.
Breweries.
Canals.
Cathedrals and Churches.
Cemeteries.
Charitable Institutions.
Climate of London.
Club-houses.
Colleges.
Corporations.
Customs Duties.
Docks, Commercial and Royal.
Ducal Residences.
East India House and Institution.

Education.
Electric Telegraphs.
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Exchanges: Royal Exchange, Coal Exchange, Corn Exchange.
Galleries of Art.
Gardens, Conservatories, &c.
Geology.
Halls.
Horticulture.
Hospitals.
Inns of Court.
Institutions.
Learned Societies.
Legislation and Government.
Libraries.
Lunatic Asylums.
Markets.
Mediæval Antiquities and Tudor Art.
Mercantile Marine.
Military Appointments.
Mint and Monetary System.
Model Lodgings.
Municipal Law.
Music.
Museums.
Natural History.
Observatories.
Palaces.
Panoramas.
Parks.
Patent Offices.
Physical Geography of the Basin of the Thames.
Pleasure Grounds.
Police.
Port of London.
Postal Arrangements.
Prisons.
Public Schools.
Public and Private Buildings.
Railway Stations.
Sewers.
Spirit of the Public Journals.
Squares.
Statuary.
Steam Navigation.
Thames Tunnel.
Theatres.
Trips in search of Refinement and Taste.
Water Supply.
&c., &c., &c.

Before proceeding with this task, we shall offer some preliminary and general observations necessary to explain to the reader the natural situation and structure of our metropolitan city; with essays on those regulations which are connected with our political organization and constitution, our domestic habits and the working of our social system; after which the several distinct subjects are treated of, and our rapid intercommunication, our inland navigation, and examples of the fine and useful arts in their application to purposes of utility and grandeur are exhibited: nor would such a picture of our organization be complete without a descriptive account of those accumulations of the wealth of nature and art in museums, which combine the treasures of the natural history of man with the fossil remains of a previous age and a former world. These the philosopher, the historian, and the sight-seer will find abundantly illustrated in this great metropolis.

"It is a fact not a little interesting to Englishmen, and, combined with our insular station in that great highway of nations, the Atlantic, not a little explanatory of our commercial eminence, that LONDON occupies nearly the centre of the terrestrial hemisphere."—SIR JOHN HERSCHEL'S *Natural Philosophy.*

ON THE PHYSICAL GEOGRAPHY OF THE BASIN OF THE THAMES.

SECTION 1. HYDROGRAPHY.—The hydrographical basin of the Thames is formed by a valley of denudation, rather irregular in its form, but whose main direction is from west to east, with a subsidiary valley, that of the Lea, running nearly north and south. The length, from the Isle of Grain and Shoebury Ness to the sources of the river, is about 230 miles; the breadth is less easily defined. In no case, however, does it much exceed 60 miles; and its average width may be taken as being about from 26 to 30 miles. The area thus drained is supposed to be 6027 square miles, though some geographers estimate it at 6500 square miles. For 188 miles of its course the river is navigable; no less than 70 miles being under the influence of the tides. The commercial importance of the river as a means of transport is, moreover, much increased by the canalization of several of its affluents; and by the execution of numerous artificial canals, which place it in connection, by water, with almost every town of importance in the south of Great Britain.

Course.—Geographers are not unanimous in deciding upon any particular spot as the source of the Thames. Indeed, the streams which dispute the honour of giving rise to it are so equal in their insignificance that the decision is of little moment. Four of them, the Leech, the Colne, the Churn, and the Isis, which rise in the Cotswold range of hills, unite near Lechlade, from which point the river becomes navigable, and is known for a considerable portion of its course by the name of the Isis. Lechlade is about 146 miles from London, and 204 from Sheerness; its elevation above low-water mark at London Bridge is 258 ft., thus showing the average fall of the river from that point to be 21 in. per mile, or about 1 in 3017.

At Lechlade, the Thames and Severn Canal locks into the Isis, thus putting the south-east and south-west coasts of England in connection with one another. This canal is 40 ft. wide on the water line, 30 ft. on the floor, and 5 ft. deep; it is navigable by boats of 70 tons burthen. The navigation of the Isis was intended for boats of 100 tons, so that it is often necessary to tranship goods passing from the river to the canal, or *vice versâ*.

After passing Lechlade, the Isis follows a circuitous course: leaving Farringdon on the south, and Bampton on the north, it runs through the grounds of Blenheim to Oxford, having received, near Woodstock, the Evenlode. At Oxford, the Charwell falls into the river; it is a stream of some importance, which rises near Culworth in the Buckinghamshire hills, and receives, at Islip, a stream from the neighbourhood of Grandborough. The Oxford Canal joins the Thames here also, opening a water-carriage to Birmingham and Warwick, by means of a canal of small section, 28 ft. wide on the water-line, 16 ft. on the floor, and 4 ft. 6 in. deep; the locks being only 74 ft. 9 in. long, by 7 ft. wide. The Isis then continues its course southerly, through Nuneham Park to Abingdon, where it receives the Windrush, and near which town also the Wiltshire and Berkshire Canal locks into it at a point where the river is 180 ft. 4 in. above the mean level of the sea at the Nore. This also is a canal of small section. The course of the river thence becomes more circuitous, with a general inclination towards the south-east (in the course of which the Ock, from the vale of White Horse, joins the main stream), to near Dorchester in Oxfordshire, where it joins the Thame, and from this point the united streams take the definite name of the Thames. The Thame rises in the same range of the Buckinghamshire hills from which the Charwell takes its source; it winds through the vale of Aylesbury, and receives at Wendover its most considerable affluent.

The Thames thence runs southerly through a gorge in the Chiltern Hills, which slope down abruptly towards the narrow valley of the river; it passes Bensington, Wallingford (where it receives a small stream), Pangbourne (where another joins it), Streatley, Maple Durham and Purley Hall to Henley. Near Reading, it receives the Kennet, which is formed by the meeting of two rivulets at Marlborough, and is augmented by subsidiary streams at Newberry and at Upton, before it joins the main river. The town of Reading itself is situated upon the Kennet, at a distance of 1½ mile from the junction with the Thames. This portion of the river is rendered navigable for boats 109 ft. long, by 17 ft. wide, and 4 ft. draught of water. Above Reading, the Kennet is canalized for a distance of 18½ miles, at which point the Kennet and Avon Canal locks into it. Boats of from 50 to 70 tons navigate on this canal, for the width of the water-line is 44 ft., of the floor-line, 24 ft., with a minimum depth of 5 ft.; the locks are 80 ft. long between gates, by 14 ft. in width. The Kennet and Avon Canal joins London directly with Bath and Bristol.

At Maidenhead the Loddon, which rises near Basingstoke and Odiham in the chalk-hills of Hampshire, joins the Thames. That river then passes round the Castle Hill to near Woburn Park and Ham, by Datchet, Staines, and Chertsey. At Staines the Colne, from the neighbourhood of Watford, falls into the Thames; and at Ham it receives the Wey, which rises near Alton, in Hampshire, runs through Farnham, and, at Guildford, receives a stream taking its source in the Bramshot Hills near Horsham, and passing through Godalming. About 1¾ mile from the embouchure of the Wey in the Thames, the Basingstoke Canal locks down into the former. The Wey itself, and its tributary from the Surrey Hills, is rendered navigable as far as Godalming; at which town a canal commences, joining the Wey and the Arun, and placing London in connection, by water carriage, with Portsmouth and the south coast. The locks in the Wey are 81 ft. long by 14 ft. wide; those on the Basingstoke Canal are 72 ft. long by 13 ft. wide, and are designed for boats of 50 tons burthen; the Wey and Arun Canal is of about the same dimensions.

The Thames then takes an easterly course through Hampton Court to Thames Ditton; thence rather northerly to Kingston and Richmond, where the Mole falls in. Lower down, at Brentford, it receives the Brent, flowing from the Hertfordshire Hills, and forming the connecting link between the upper part of the Thames and the Grand Junction Canal. This main artery of the system of English artificial navigation places London in connection with all the important canals in the midland counties. Its width on the water-line is 43 ft., its depth 5 ft.; the locks are 82 ft. long by 14½ ft. wide, and usually of 7 ft. lifts.

The Wandle falls into the Thames at Wandsworth, and several small streams join the river between Brentford and the metropolis; some even, formerly of note, do so in the very heart of the town. Rivers have their fortunes, like nations, and at times small ones disappear before the progress of civilization, or at least become converted to most base uses. Thus we now can only trace such streams as the Bayswater Brook, the Fleet, Wall Brook, and the other rivulets of ancient London, in the modern sewers.

On the east of London, a little below Blackwall, on the northern shore, the Lea falls into the Thames. This affluent rises in the hills of Hertfordshire, and flows through Puckeridge and Welwyn. At Ware, it receives several minor streams, and near Hertford, at 26 miles from its outfall into the Thames, it is rendered navigable for boats not exceeding 40 tons. The course of the river Lea is southerly from Hoddesden to the outfall, and it divides the counties of Hertfordshire and Middlesex. At Hertford the navigation commences at a point 111 ft. 3 in. above the sea; and there is also, near the same city, a canal 5 miles long, by means of which the Lea navigation is connected with that of the Stort. A short distance from the embouchure a canal, called Sir George Duckett's Canal, connects the Lea with the upper part of the Regent's Canal; and, nearer still to the embouchure, the Lea Cut, of 1½ mile in length, enables barges to gain the upper part of the Thames without passing round the Isle of Dogs. The Regent's Canal is, in fact, the termination of the Paddington branch of the Grand Junction Canal. The Paddington branch begins at a point near Uxbridge, 90 ft. above low water at Limehouse, and runs a distance of 14 miles to Paddington. There the Regent's Canal joins it, and is continued round the north of London to Limehouse, a distance of 8½ miles, with a fall of 90 ft., gained by 12 locks.

On the southern shore, a little higher up than Blackwall, the

Deptford Creek forms the embouchure of the Ravensbourne, which flows from the Surrey Hills in the neighbourhood of Hays Common and Addiscomb. It is navigable for a very short distance inland, during the remainder of its course it is but a small mill-stream.

From Blackwall to the sea, the only affluents of importance are, on the northern shore, the Roding, which falls into the Thames at Barking Creek, and is navigable as far as that ancient town. In Dagenham Marsh, a stream from the hills round Havering-atte-Bower falls in; at Rainham, the Ingerburn discharges itself; and at Purfleet, a small stream from Childerditch Common is swallowed up in the continually increasing river. On the south side, in the marshes of Dartford, the Darent and the Cray, from the Kentish Hills, join shortly before falling into the Thames. Their united stream is navigable with the tide as far as the town of Dartford. In the last 20 miles of the course of the Thames it does not receive any affluent worth notice; and, in fact, may rather be considered an arm of the sea than a river.

At a very early period of English history, the Thames appears to have been considered as a political boundary of great importance. The division of the country into shires is supposed to have been established on its present basis by King Alfred; and we therein find that the Thames was adopted as the boundary of many of these districts at an inconsiderable distance from its source. A little below Lechlade, in fact, the river Isis separates the counties of Berkshire and Oxfordshire; it then forms the line of demarcation, either under the name of the Isis or the Thames, between Buckinghamshire and Berkshire; then between Surrey and Middlesex; and finally between Kent and Essex. But, long before the time of Alfred, the river was adopted as the political limits of the Roman provinces of Britannia Prima on the south, and of Flavia Cæsariensis on the north. In the seventh century also it formed one of the boundaries of the Saxon kingdoms of Mercia and West Seaxe, in the middle of England; and of those of East Seaxe, South Seaxe, and Cantivare, on the eastern coast.

Volume.—The volume of the Thames, in the parts unaffected by the tide, is, as might be expected, from its comparatively insignificant basin, not very considerable. Mr. J. Rennie's observations at Windsor, during the dry month of June, 1794, only gave a volume equal to 961 cubic feet per second. Mr. G. Rennie's observations, in the year 1835, showed, that at Laleham the volume was 1153 cubic feet per second; and at Kingston, 1600. After a heavy fall of rain, the volume at the latter point was augmented to 1800 cubic feet per second; but in this case the river was 18 in. above its summer level. Mr. Anderson found, in the month of December, 1830, that the volume at Staines was 2050 ft. per second, the river then standing 4 ft. above the summer level. At Teddington, Mr. Anderson calculated that, with an 18-in. overfall at the locks, the volume was 700 ft.; and with a 24-in. overfall, it was 1260. Taking a mean of these three last mentioned volumes, we may assume that the Thames, in the parts removed from the influence of the tides, on the average, has a volume equal to 1357 cubic feet per second, or 115,516,800 ft. per day, and 42,163,632,000 cubic feet per annum. Now Dr. Halley, assuming the average rain-fall of the whole basin to be 24 in., calculated that its total amount would be 280,259,555,200 cubic feet per annum. The loss by evaporation and absorption would then constitute about $\frac{5}{6}$ths of the total rain-fall;—certainly a very small portion, when compared with the same loss in other hydrographical basins. It may be accounted for either by the highly retentive nature of the bed of the river, or by the moisture of the atmosphere. Dr. Halley calculated the loss by evaporation at only $\frac{1}{7}$th of the total rain-fall; but this is evidently exaggerated.

The numerous works connected with the navigation of the upper part of the Thames, together with the weirs and dams of the water-mills, interfere so much with the flow of the water as to render its velocity very different from that which would result from its different inclinations. Mr. J. Rennie assumed it to be on the mean 2 miles per hour; in some cases it is as much as $2\frac{3}{4}$ miles; and at Windsor, in 1794, he found it to be $2\frac{1}{2}$ miles per hour.

Tides.—Below Teddington the river is exposed to the action of the tides, which, from a peculiar combination of causes, act with great force in the Thames. The tide wave from the Atlantic divides at Land's End into two streams, one of which runs up the British Channel and enters the Thames round the North Foreland; the other passes along the west coast of England and Scotland, and returns southward by the eastern shore, and enters the Thames also, after passing the Yarmouth Roads. The tide in the river is then composed of two tidal waves, distant 12 hours from each other, so that the day and night tides are equal; the tides meet between the Foreland and the Kentish Knock. The velocity of the wave from the North Foreland to London is very great, being about 50 miles per hour; above the bridges, from the resistances it meets, the velocity is so much diminished that the wave is not propagated more rapidly than 12 miles an hour on the average. The difference of time of high water between London Bridge and Richmond is 1 hour 18 minutes.

The same resistances which retard the flow of the tidal wave affect the duration of its rise. Thus at London Bridge we find that the flood tide runs for 5 hours, and the ebb tide for 7. At Putney Bridge the flood only lasts for 4 hours; at Richmond for 2; and at Teddington only for $1\frac{3}{4}$ hour. The rise of the tide at Deptford is in the spring tides 19 ft. 2 in., in the neaps, 15 ft. 3 in. At the London

Docks it is, on the average of the spring tides, 18 ft.; at Putney, 10 ft. 2 in.; at Kew, 7 ft. 1 in.; at Richmond, 3 ft. 10 in.; and at Teddington, 1 ft. 4½ in. Professor Airy observed, that the rise of the water in the Thames, at a given interval from low water (in half an hour, for instance), is considerably more than its descent in the same interval before low water. There exists, in fact, the rudiment of a bore. The duration of slack water, or the interval between the change of direction of the stream, is 40 minutes during the spring tides, and 37 minutes during the neaps, at Deptford.

The vulgar establishment is the interval by which the time of high water follows the moon's transit on the day of new and full moon. What Sir John Lubbock calls the corrected establishment, or the lunar hour of high water freed from the semimenstrual irregularity, is found to be, at the London Docks, 1 h. 26 m. The interval of the high tide and moon's transit is, however, affected by a considerable inequality, which goes through its period twice in a month, depending on the moon's distance from the sun in right ascension, or on the solar time of the moon's transit. Its value is two hours.

The direction of the winds has a great influence on the tides of the Thames, not only as to the height they attain, but also as to their duration. Thus with north-westerly gales they do not rise so high, nor does the flood run so long, as with the wind in any other quarters. With south-westerly gales, however, and with those from the east, the tides often rise even as much as 4 ft. above their usual levels. The demolition of the old London Bridge is also said to have produced an increase of the height of the tide to the extent of 2 ft.; whilst it is very certain that the bed of the river and the low-water mark have been considerably lowered by the same cause. This lowering of the bed is regularly distributed over the whole length of the river, from the bridge to Teddington; and it appears to be not less than 2 ft. at the former, and about 10 in. at the latter.

The recent movements which have taken place near Blackfriars Bridge would induce us to believe that the depression of the river bed is much greater than even this quantity.

The velocity of the current created by the tidal wave is between 3½ and 2½ miles per hour; 3 miles being the average, and also the velocity most suitable to the navigation carried on in the upper parts. At the ebb the greatest velocity appears to be between the bridges, as follows:—

From Westminster to Waterloo Bridges	2·27	miles per hour.
„ Waterloo to Blackfriars „	2·854	„
„ Blackfriars to Southwark „	3·70	„
„ Southwark to London „	3·903	„

The areas of different portions of the river at high water at the following points between the above limits being—

Whitehall	23,500	feet superficial.
Hungerford Market	22,000	"
Waterloo Bridge	21,000	"
Opposite Bouverie Street	18,000	"
Southwark Bridge	17,000	"
London Bridge	17,600	"

This irregularity in the area fully accounts for the formation of the loathsome beds of mud which disfigure the river at low tide, and demonstrates painfully the defective state of the regulations connected with the formation and maintenance of the course of the river.

Banks of Lower Thames.—The banks of the lower part of the Thames are marked by the same want of a definite plan which renders the upper part of the stream less useful than it might be made. The period at which they were first formed is very remote, being by some supposed to date as far back as the time of the Romans. This, indeed, seems very probable, for the manner in which the banks are executed, though eminently successful, is marked by all the clumsiness of a first essay. The marshes they protect from the river are sometimes (as at Woolwich) not less than 4 ft. 3 in. below the level of the high water in spring tides. Those of the Isle of Dogs are now being enclosed by an embankment upon piles, with a superstructure in brickwork, executed in conformity with a plan prepared by Mr. Walker, under the direction of the Navigation Committee; thus indicating that the attention of that body has been fairly called to the necessity of co-ordinating all encroachments upon the channel of the river to one general system. The result of the several works upon the bed of the Thames, and the demolition of the old bridge, has been hitherto to lower the bed, and to compromise the safety of several of the bridges in the stream, and of some of the buildings on the shore. It is to be hoped that the legislature will take some measures to remedy the dangerous and defective state of the present organization of the conservancy of the river.

Moreover, in the lower Thames, that is to say, in those parts of its course below London Bridge, numerous shoals exist, which are highly prejudicial to the safety of the navigation, whilst at the same time there is no reason why they might not be carried further out towards the embouchure if the course of the river were regularised, and the dredging operations made to conform to the necessities of the port. These shoals exist in the parts of the Thames in which the deep sea navigation terminates, where, in fact, from the more energetic action of the tides, the floods from the upper country begin to deposit the matter they hold in solution.

The force with which the tidal wave enters the mouth of the Thames prevents the detritus borne down by the upper stream from being carried sufficiently far towards the embouchure to form a Delta.

It is therefore deposited at those points of the course of the river at which the propulsive power of the land waters is counterbalanced by that of the tide wave, which tends to force the detritus back again. The still water thus produced is exposed to great changes in its position and extent from an infinity of local and accidental causes; so that the shoals vary very frequently without any apparent cause. Their real origin, however, may be attributed to the interferences with the regularity in the flow of the river by natural deviations of the line of the banks, or by the execution of ill-contrived, ill-planned works.

For instance, we find that a shoal exists on the north shore, opposite to the recesses formed by the east entrance of the London Dock on the north, and the St. Saviour's Dock on the south; these give rise to reaches of still water, in which the detritus from the upper part of the river can be deposited. A similar shoal is formed opposite to the Lime Kiln Dock; another in a wide reach a little above the Greenland Docks; a fourth near the embouchure of the Ravensbourne in the Thames, which may be attributed to the direction in which it falls into the main stream, precisely the reverse to what would be required in the interest of the navigation. Opposite Saunders Ness are shoals on each side of the river, owing to the retardation of its velocity from the abrupt bend it here forms; a small shoal in the mid stream, a little lower down than these side ones, appears to owe its origin to the interference they produce on the direction of the currents. Another small shoal is produced by the still water opposite the entrance of the West India Docks. At the embouchure of the Lea, owing to the interference of the upland waters of that river with those of the Thames, two shoals are formed near Bugsby's Hole. It is probable that the effectual removal of these two may be attended with considerable difficulty; but all the others might easily be remedied.

Estuary.—Below this point the river begins so distinctly to assume the characteristics of an estuary, that it is almost impossible to define with certitude the position of the shoals, still less would it be possible to prevent their formation, or effectually to combat them. At Woolwich the water becomes brackish at spring tides, and the greater specific gravity it thence attains modifies the conditions of the deposition of the matter it holds in suspension. The difference between the lengths of time during which the flood and the ebb tides prevail, also diminishes as the river approaches the sea. Moreover, the action of the current upon the shores of the embouchure, at the same time that it removes the land on both sides, and thus changes the form of the outfall, so also does it carry into those portions of the estuary where still water is to be met with, the materials resulting from the degradation of the shores. The variations of the tides from the neap to the spring, the changes in the force and direction of the deep sea current, possibly from the effects of storms in very different and distant latitudes; the irregularities of the volume of fresh water brought down from the upper regions of the Thames, combine to render its "regime" in the lower and wider portions of its course very irregular and capricious. The sands of the Nore vary often in their outline, and their distance from the surface of the water; the erosive force of the current upon the banks also varies in intensity according to the action of the causes shortly enumerated above.

The erosions of the sea upon the shores of the estuary of the Thames are very rapid, both upon the Essex and Kentish coasts. The cliffs of Walton-on-the-Naze are rapidly disappearing; the Maplin Sand, near Shoebury Ness, may, perhaps, be considered as having formed part of the main land in former times. The Isle of Sheppey, and the coast near Herne Bay, are being swept away in a gradual but inevitable manner; nor is the land forming the promontory between the embouchures of the Thames and the Medway removed from the same cause of destruction. All the materials thus removed, combined with the detritus brought down by the fresh water, are deposited in, or near, the estuary of the Nore, where they form the extensive banks, or shoals, visible at low water. It is extremely difficult to ascertain the amount of sediment carried down by the river itself; but from the nature of the formations it traverses in the latter portion of its course, and the comparatively feeble inclination of its bed, the proportionate amount of matter in mechanical suspension, in all probability, is very considerable.

In the section of the Physical Geography of the Basin of the Thames, in which we treat of the geology of the district, will be found the areas occupied by the different formations which constitute it; and through which it travels. These influence the hydrography of a district to a very great extent, not only in consequence of the different capacity of the strata for the absorption of water, but also in consequence of the manner in which they furnish the materials held either in mechanical or chemical solution, or suspension, in the stream. Thus it must be evident that the water flowing from the oolitic and the cretaceous formations is more likely to be charged with the carbonate of lime than that which drains from such portions of the surface as are covered by the London clay. These, again, from the nature of the vegetation they nourish with the greatest profusion, are likely to communicate to the waters they furnish the germs of animal and vegetable organization. The open, spongy nature of the two former classes of formation must, moreover, make them more retentive of water than the comparatively speaking impermeable strata of the London clay. The greater number of the affluents of the Thames, it is true, take their rise in the oolites and in the chalk; but their volumes are comparatively less than those which are furnished by the London clay, especially when we compare the respective lengths of the streams.

In the same section will also be found the heights of some of the most important elevations of the district under our examination. They also have considerable influence upon the hydrography of the basin, both by their action in determining a greater or less amount of rain-fall, by attracting and condensing the moisture suspended in the atmosphere, and by affecting the rate of discharge of the surface water.

Matter in Suspension.—The positive quantity of extraneous matter contained in the Thames water does not seem to have been ascertained with any degree of certainty; nor does the range of tidal action upon suspended matter in it appear to have been made the subject of direct experiment. Dr. Bostock is reported to have estimated the proportion of solid matter in suspension in the river water as being $\frac{1}{5000}$th of the weight; Mr. Kerrison's experiments would show it to be $\frac{1}{32117}$th; and in all probability this estimate is a low one. The calculation of Dr. Bostock was made before 1828, that of Mr. Kerrison in 1834. Since then the nature of the river water has been modified by the incessant wash of the steamers; but we must also observe, that if the continual agitation produced by them prevents the deposition of the mud, yet at the same time, from the increased and increasing scour of the river, the bed is considerably cleaner than it used to be, especially in the parts above bridge. The evidence given before some of the Parliamentary Committees would lead us to infer that the greater part of these impurities are derived from the upper parts of the river and from its affluents. At Richmond the Thames is as foul as in the heart of the town, according to the engineers examined. The Wey, and the Mole especially, bring down very turbid waters, as does also the Colne, near Isleworth, after heavy rains. It is to be observed, however, that the modifications of the bed of the river from the removal of London Bridge are far from having yet produced their full effect. Neither the river itself, nor the banks in the embouchure, nor the bed in the upper portion, have yet assumed the definite regime that absurdly-delayed measure seems likely to produce.

Floods.—Floods occur in the valleys of the Thames and the Lea occasionally. They arise entirely from the surface waters, hardly ever from the melting of snow, or ice, in the highlands near their sources. Indeed, the climate of this part of England, and the feeble elevation of its hills, does not admit of the duration of frost for a sufficient length of time to affect the sources of the river supply. Under these circumstances, the floods are found to occur in the rainy seasons, in November and December, in April and in May, without, however, being in any manner peculiarly confined to those months. The flood waters brought down to the rivers are highly charged with earthy matter and the germs of organized life; they, in fact, materially influence the formation of the alluvial deposits of the river.

Ehrenberg mentions a fact of considerable importance in the discussion of questions affecting the relative purities of river water. It is, that in all the rivers which fall into the German Ocean the microscopic animals of the sea extend up rivers as far as the ebb and flow of the tide extend. His researches show that the flood tide, even when the surface waters have no taste of salt, does not so much depend upon an accumulation of river water from its outflow being checked as it does upon the introduction of sea water under the river water, owing to its greater specific gravity. Ehrenberg found that the remains of the microscopic sea animals constituted no less than $\frac{1}{20}$th of the solid matter found in the banks of the estuary.

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SECTION 2. CLIMATE.—London itself is situated in 51° 31′ of north latitude; and the line passing through its eastern extremity of Greenwich has been adopted by the Anglo-Saxon race as the zero of longitudinal distances. The length of the continuance of the sun above the horizon is $7\frac{3}{4}$ hours on the shortest day; and $16\frac{1}{2}$ hours on the longest. The mean temperature of the rural district round the metropolis is 48°·50; that of the city itself is 50°·50; the mean of the whole district being 49°·65. The variations in the temperature recur with what appears to be tolerable regularity after a cycle of 17 years; during which the coldest falls at the 10th from the first year; the warmest at the 7th from the coldest; the first year, marking the cycle, being usually of the mean temperature.

The greatest heats known have not exceeded 96° in the shade and in the open air; the cold sometimes descends as low as 5° below zero; the range being 101° Fahrenheit. When the temperature exceeds 80°, thunder-storms usually clear the atmosphere and reduce the heat. As a general rule also, the frosts do not last through the 24 hours, and a continuance of them for any length of time is quite exceptional. The upper part of the Thames was blocked up by the frozen ice in 1840, and to a somewhat greater extent in 1826. With these exceptions, however, the ice has not seriously impeded the navigation since the years 1814 and 1815. In former times the river was frozen over more frequently than it has been of late years, thus confirming the opinion that the progress of civilization tends to modify and improve the climate. In the works upon Physical Geography, London is placed on the 64th degree of the isothermal range; and on the 38th of the isokemenal divisions.

Thermometrical Observations.—The monthly averages of temperature, taken over a range of 20 years, show that the warmest months only differ from the coldest by 26½°, and that the temperature of the city differs 2½° from that of the country. This local difference is greatest in winter, as might naturally be expected from the more sheltered position of the metropolis, and the artificial elevation of the temperature produced by the immense number of factories and domestic fires. In the spring, the heat of town and country approaches equality; the difference becomes again perceptible in summer, owing to the reverberation from the narrow streets, and the want of air; in autumn again the equality is resumed. Thus, between the years 1807 and 1816 included, we find the mean temperatures of the different months to have been as follows, viz.:

Months.	Country.	London.	Difference.
	°	°	°
January	34·16	36·20	2·04
February	39·78	41·47	1·69
March	41·51	42·77	1·26
April	46·89	47·69	0·80
May	55·79	56·28	0·49
June	58·66	59·91	1·25
July	62·40	63·41	1·01
August	61·35	62·41	1·26
September	56·22	58·45	2·13*
October	50·24	52·23	1·99
November	40·93	43·08	2·15
December	37·66	39·40	1·74

The mean temperature, as shown by an examination of the tables of observations extending over 35 years, assumes a rate of increase in the different months which may be represented by a curve nearly equal to, and parallel with one representing the progress of the sun in declination.

The greatest number of the extremes of heat and cold occur in the first month of the year. On an average of 10 years only two occurred in the twelfth month, and one in the second. The extremes of heat are more diffused through the remaining months; five usually fall in the seventh month; the others are distributed, in a diminishing proportion, over the months earlier or later in the summer. There are thus only two spring and two autumn months, which are not exposed to great varieties of temperature. The ranges of the thermometer in the day-time, for the years between 1807 and 1816, are thus given by Mr. Howard in his admirable work upon the climate of London, from which in fact we have extracted nearly all we give upon the subject.

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* There appears to be some error in the mean quoted for the month of September; in the previous decade the difference was considerably less, and it appears usually to be only 1°·77.

Years.	Highest.	Lowest.	Range.	Medium.
	°	°	°	°
1807	87	13	74	50
1808	96	12	84	54
1809	82	18	64	50
1810	85	10	75	47·5
1811	88	14	74	51
1812	78	18	60	48
1813	85	19	66	52
1814	91	8	83	49·5
1815	80	17	63	48·5
1816	81	5	86	38
Averages .	85·3	12·4	72·9	48·85

The mean of the daily extremes having been . 48°·79
Ditto of the monthly ditto . . . 48°·34
Ditto of the years, as above . . . 48°·85

Between the years 1817 and 1831 the examination of the tables gave the mean of the daily extremes . . . 49°·649
That of the months . . . . . 49°·651
That of the years . . . . . . 49°·721

Perhaps from 90° to 20° may be regarded as the extreme ranges in the day-time. At night the temperature has descended below zero; but so very rarely as to make such an occurrence phenomenal.

In London the mean variations between the temperature of the day and the night are 11°·37; in the country they are 15°·41. In the former, the mean height during the day being (according to the observations made between 1816 and 1817) 56°·17; during the night 44°·80. In the latter it was during the day 56°·51, during the night 41°·10. The extreme range appears to be in the sixth month, in which it has been known to attain from 35° to 37°. During the period between the years 1817 and 1823, the difference appears to have been greater; for the mean of the greatest heat in the country was 57°·926, at night it was 40°·614, the difference being 17°·312. It is remarkable that this difference corresponds, to the fraction of a degree, with that which prevails between the temperature of summer and winter.

The temperatures of the different months were ascertained from a series of observations, extending over the years from 1805 to 1830 inclusive, to be on the average as follows:—

Months.	Mean.	Variation.
	°	°
January	35·140	13·95
February	38·997	12·26
March	42·030	11·20
April	47·567	8·64
May	54·937	11·99
June	59·613	9·36
July	63·190	8·68
August	57·187	8·89
September	50·123	9·80
October	42·432	12·88
November	41·950	10·19
December	38·343	12·40

Finally we may observe, that hoar frosts occur when the thermometer is about 39°; and that the dense yellow fogs so peculiar to London occur the most frequently in the months of November, December, and January, whilst the thermometer ranges under 40°.

Barometrical Pressure.—The barometer is subject to variations of a similar nature to those of the thermometer; that is to say, they are frequent and unexpected, but rarely of any great amount. During the years between 1807 and 1816 the mean of the twelve greatest elevations was 30·305 in.; that of the twelve greatest depressions was 29·188 in.; the medium of the elevations and of the depressions was 29·746 in. The highest observations during that period were 30·71 in., although subsequently they have been made at 30·89 in., during the prevalence of north-easterly breezes. The lowest observations were at 28·22 in. with southerly winds; the greatest range being thus 2·67 in.; the average range 1·998 in.

Between 1815 and 1830 similar observations gave as the mean of the twelve greatest elevations 30·356 in., and of the twelve greatest depressions 29·075 in.; the medium of the elevations and depressions being 29·715 in. The highest annual mean was in the year 1825, when the twelve greatest elevations gave an average of 30·82 in.; the lowest was in 1831, when the twelve greatest depressions gave a mean of 28·26 in. In the year 1821, the variation even extended to 3 in.; but over the period from 1807 to 1831 the mean range was only 2·07 in.

The monthly variations may be represented as follows:—

Months.	Maximum.	Minimum.	Diff. or mean.	Greatest elevation.	Greatest depress^{n}.	Full range.
	°	°	°	°	°	°
January . .	30·515	28·937	1·578	30·82	28·69	2·13
February .	30·459	28·824	1·435	30·80	28·45	2·35
March . .	30·417	28·895	1·522	30·75	28·35	2·40
April . .	30·330	29·042	1·282	30·57	28·50	2·07
May . . .	30·307	29·262	1·045	30·61	29·06	1·55
June . . .	30·282	29·335	0·947	30·54	29·12	1·42
July . . .	30·216	29·375	0·841	30·57	28·99	1·58
August . .	30·262	29·235	1·027	30·57	28·75	1·82
September .	30·292	29·207	1·085	30·50	28·52	1·98
October . .	30·346	29·009	1·337	30·67	28·52	2·15
November .	30·377	28·970	1·407	30·65	28·30	2·35
December .	30·449	28·820	1·629	30·80	27·80	3·00

Winds.—The direction of the winds appears to be principally from the south and the west, over the district formed by the basin of the Thames. Starting from the north, we find that the winds blew during 74 days in a year, on the average of the years between 1807 and 1816 inclusive, from points varying from that point towards the east; the extreme numbers of days during which they thus blew from points between the north and the east being 96 and 58 respectively. The average number of days they blew from between the east and the south was 54; the extremes being 72 and 34 respectively. From between the south and the west the average number of days was 104; the extremes being 123 and 78. From between the west and the north the average was 100 days; the extremes being 124 and 83. The variable winds blowing 33 days on the average, between the extremes of 51 and 17 in the course of the year.

If the winds be only grouped under the denominations of easterly and westerly, it would be found that the former prevailed during 140, the latter during 225 days. If they be grouped under the denominations of northerly and southerly, the former would be found to have prevailed during 192 days, the latter during 173.

During the several months of the years between 1807 and 1816 the winds varied as follows: the table having been calculated for the years mentioned above. The variations between 1817 and 1823 corresponded so closely with the average results deduced from this table, that it may be considered as a very correct representation of the actual state of the case for that subsequent period.

Months.	N. & E.	E. & S.	S. & W.	W. & N.	Variable.	Total.
	Days.	Days.	Days.	Days.	Days.	Days.
January . . .	6·8	5·3	7·0	9·1	2·8	31
February . . .	3·2	4·0	11·7	7·4	1·7	28
March	9·8	5·4	6·6	6·5	2·7	31
April	8·3	5·6	6·0	6·4	3·7	30
May	5·9	6·5	9·0	5·6	4·0	31
June	7·1	3·0	7·2	9·1	3·6	30
July	4·5	2·5	9·5	11·5	3·0	31
August . . .	3·5	2·9	10·2	12·9	1·5	31
September . .	6·4	6·0	8·0	7·4	2·2	30
October . . .	5·2	5·0	10·5	7·4	2·9	31
November . .	7·8	3·1	8·8	8·4	1·9	30
December . . .	5·0	4·6	9·9	9·7	1·8	31
Monthly average, 1807 to 1816	6·0	4·5	8·7	8·45	2·65	
Monthly average, 1817 to 1823	6·14	4·9	8·5	9·45	1·41	

Mr. Daniell observes that the force of the winds does not always decrease as the elevation above the ground increases; but on the contrary is often found to augment rapidly. More than two currents may often be traced in the atmosphere at one time by the motion of the clouds. The land and sea breezes of morning and evening do not recur with sufficient regularity in these latitudes to be appreciable in their influence upon the results of the tables.

Northerly winds almost invariably raise the barometer, while southerly winds as constantly depress it. The most permanent rains in this climate come from the southern regions. The least rain falls when the winds range from the north to the east.

Evaporation.—The evaporation which takes place near London was calculated by Mr. Daniell to be on the average 23·974 in. in a year. This result was obtained from a series of observations made by the means of an hygrometer of that gentleman's invention. Mr. Howard's observations gave results which substantially confirmed those made by Mr. Daniell, for he found that with a gauge placed at a height of 43 ft. from the ground, exposed to the south-east, and subject to the action of the winds, he obtained a mean total of

37·85 in. upon the years 1807, 1808, and 1809, which were very dry warm years. In the years 1810, 1812, with a fall of rain considerably above the average, the evaporation gauge, placed at a lower level and less exposed, only showed a mean of 33·37 in. In the years 1813 and 1815, which again were dry years, the gauge placed immediately upon the ground and sheltered, showed a mean evaporation of 20·28 in. Mr. Howard suggests that probably the rate of 33·37 in. may represent the rate of evaporation which takes place from running streams in exposed situations; the rate of 20·28 in. may also represent that of canals and reservoirs of still water.

Mr. Howard also gives a condensed tabular statement of the mean evaporation corresponding with the different seasons, and their mean temperatures, as follows:—

	In.		°	
Winter	3·587	Evaporation.	37·20	Temperature.
Spring	8·856	,,	48·06	,,
Summer	11·580	,,	60·80	,,
Autumn	6·440	,,	49·13	,,

This is considerably in excess of Mr. Daniell's total evaporation, but that may be accounted for by the different conditions under which the observations were made.

Mr. Daniell estimates the rate at which this process proceeds near London during the several months of the year as follows:—

	Inches.		Inches.
January	0·413	July	3·293
February	0·733	August	3·327
March	1·488	September	2·620
April	2·290	October	1·488
May	3·286	November	0·770
June	3·760	December	0·516

The smallest quantity of water is therefore lifted into the air during the month of January, and the greatest in June. The mean quantity held in solution in a cubic foot of air is said to be 3·789 gr.

Mr. Leslie invented an instrument for the purpose of measuring the exhalation from a humid surface in a given time, which he called an atmometer. He estimated that the daily exhalation from a sheltered surface of water, in the neighbourhood of London, would, at the mean dryness of winter, lower it 0·018 in. in 24 hours; and at the mean dryness of summer as much as 0·048 in. The effect of the winds upon the amount of evaporation is, however, a very important element of all such calculations; it is sometimes augmented five or even ten times. In general, this augmentation is proportional to the swiftness of the wind; the action of still air itself being reckoned equal to that produced by a speed of 8 miles an hour.

The greatest known evaporation in a month has attained as much as 6 inches; the least 0·21 in. In the month of March, 1809, during 3 days a very extraordinary evaporation took place. On the 17th it was 0·39; on the 18th 0·28; and on the 19th 0·14 in.

Rain.—The quantity of rain which falls near London is differently stated by Mr. Daniell and Mr. Howard. The former states that the average is 23$\frac{1}{10}$ inches in the year; the latter, that the average from his observations between 1797 to 1819, or 23 years, was 25·179 in. The latter quuantity is usually considered correct. The years which gave the greatest amount of rain were 1816, when it amounted to 32·37 in., and 1797 when it was equal to 29·996 in. Those which gave the least were 1807, when it was 18·01 in., and 1802, when it was 18·428 in. Subsequent observations made at Greenwich have shown that in the year 1841 the rain-fall was not less than 33·26 in.; in 1840 it was 16·43 in. only, and in 1847, 17·61 in. The mean of these observations at Greenwich made between the years 1838 and 1849 was, however, 24·84 in., approaching sufficiently near to the mean given by Mr. Howard from his observations made at a lower level; for it is a well-known law of the fall of rain "that smaller quantities have been observed to be deposited in high than in low situations, even though the difference of altitude should be considerable."

The quantity of rain which falls in the different months is calculated by Mr. Daniell, and was observed by Mr. Howard, to be as under: the third column contains the number of days during which the rain fell in each month, as given by Mr. Howard:—

Months.	Daniell.	Howard.	Days.	No. of days' rain in six months.	Quantity of rain in six months.
January . . .	1·483	1·907	14·4		
February . . .	0·746	1·643	15·8		
March . . .	1·440	1·542	12·7		
April	1·786	1·719	14·0		
May	1·853	2·036	15·8		
June	1·830	1·964	11·8	84·5	10·811
July	2·516	2·592	16·1		
August . . .	1·453	2·134	16·3		
September . .	2·193	1·644	12·3		
October . . .	2·073	2·872	16·2		
November . .	2·400	2·637	15·0		
December . . .	2·426	2·489	17·7	93·6	14·368
Totals . .	22·199	25·179	178·1	178·1	25·179

There is a little discrepancy between the total resulting from the subdivision of Mr. Daniell's calculations and the average total of 23 $\frac{1}{10}$th he gives elsewhere. But the two sets of observations agree in this—that the month of February is the driest, because the shortest perhaps, in the year, and that the month of July is the wettest. In fact, Mr. Daniell's calculations were far from having been made with the care of the more veteran observer, Mr. Howard: we find that the former states the mean rain fall, as obtained from seventeen years' records at Chiswick, to be different from both the quantities he had previously given, for he quotes it at 24·16 in., and he makes the mean evaporation equal to 29·598 in. in the same epoch.

The greatest quantity known to have fallen in twenty-four hours is 2·05 in. The proportion of what falls when the sun is above the horizon is only ⅔rds of that which falls when it is below it.

Mr. Howard states that the quantity of rain which falls in the different seasons is as follows:—

	Rain.	Mean Temp.
Winter . .	5·868 inches.	37·20°
Spring . .	4·813 „	48·06
Summer . .	6·682 „	60·80
Autumn . .	7·441 „	49·13

The same author observed that one year in five is exposed to the dry extreme, whilst one year in ten is exposed to that of wet. The warm years are generally dry; the cold ones damp.

Fogs.—The local phenomenon of the frequence of fogs in the district of the immediate neighbourhood of London appears, firstly, to be owing to the presence of the river; and, secondly, to the fact that the superior temperature of the town produces results precisely similar to those we find to occur upon rivers and lakes. The cold damp currents of the atmosphere, which cannot act upon the air of the country districts, owing to the equality of their specific gravity, when they encounter the warmer and lighter strata over the town displace the latter, intermixing with it, and condensing its moisture. Fogs thus are often to be observed in London, whilst the surrounding country is entirely free from them. The peculiar colour of the London fogs appears to be owing to the fact that during their prevalence the ascent of the coal smoke is impeded, and that it is thus mixed with the condensed moisture of the atmosphere. As is well known, they are often so dense as to require the gas to be lighted in midday, and they cover the town with a most dingy and depressing pall. They also frequently exhibit the peculiarity of increasing density after their first formation, which appears to be owing to the descent of fresh currents of cold air towards the lighter regions of the atmosphere.

They do not occur when the wind is in a dry quarter, as for instance when it is in the east; notwithstanding that there may be very considerable difference in the temperature of the air and of the water, or the ground. The peculiar odour which attends the London fogs has not yet been satisfactorily explained, although the uniformity of its recurrence and its very marked character would appear to challenge elaborate examination. In all probability it arises from some modification of the atmosphere, which must have considerable influence upon the sanitary state of the metropolis. It is possible that, to a certain extent, it may be attributed to the chemical nature of the strata upon which the town is built. At least this is certain—that in many isolated cases wells, formed through the London clay, give forth a very considerable amount of the sulphuretted hydrogen gas, which seems to produce the characteristic odour of the fogs in question.

Dews.—Dews exercise a considerable influence on the state of the atmosphere with respect to the amount of evaporation, or rather to the balance of the hygrometric causes. In our latitudes they are supposed to yield as much as 5 in. per annum, or a quantity equal to nearly $\frac{1}{5}$th of the total rain fall. Mr. Howard noticed that in one night as much as $\frac{1}{10}$th of an inch was collected in a rain gauge.

The greatest quantity of dew falls from a little before sunset to a little after sunrise, its proximate cause depending on the diminution of temperature between those periods, which acts to cause the atmosphere to deposit the moisture it holds in suspension. The difference in the temperature which produces this effect is greatest in the day and night seasons of spring and autumn, when as much as from 20 to 30 degrees are often found to exist between them in the neighbourhood of London. A calm clear atmosphere is necessary for the deposition of dews, which in this differ from mists (whose origin is nearly the same), for they deposit at all times of day or night, and in all states of the atmosphere. The abundance of dew depends on the large quantity of moisture suspended in the atmosphere at the moment of the action of the immediate causes. Hence it is most copious on calm clear nights, succeeded by misty and foggy mornings. In England, heat and dry weather are rarely accompanied by dews; the greatest amount falls after rain in cool summer nights, generally with southerly and easterly winds, with a depression of the barometer. Hoar frost, the ice of dew, is common in the winter months, and it is regarded as a sure sign of wet weather.

Mr. Daniell calculated the mean dew point at 44°·31 from the average of a series of observations made between the years 1826 to 1842 at Chiswick, where they were carried on at a height of 14 ft. above high-water mark. The range of the dew point was between 79° and 0°. The mean elastic force of the vapour was 0·342 in., varying between 0·973 and 0·051 in.; a cubit foot containing on the average 3·806 grains of moisture at that position.

The dew point was lowest with northerly and easterly winds; highest when they were southerly. It would also appear that a difference was observable when they blew from the sea or from the land. A number of observations of the relation between the direction of the winds and the dew point gave the following results; the first numbers being those upon which the mean was based, the last the mean dew point:—

		°			°
87	North	40·1	113	North-east	40·7
80	East	42·3	111	South-east	45·6
70	South	48·7	225	South-west	48·6
215	West	44·8	174	North-west	41·3

Electrical Phenomena.—Electrical phenomena act constantly, but rarely with much energy, in the latitude of the London basin. Thunder storms occur in the warm summer months, re-establishing the balance of the electrical states of the moisture suspended in the atmosphere. But, as they take place usually with a feeble temperature, they are seldom violent, nor are they accompanied by the terrific hail which desolates warmer countries. They usually are accompanied by copious rains in summer; when they happen in winter they are often accompanied by the nearest approaches to hurricanes we are acquainted with. The Aurora Borealis occasionally visits the neighbourhood of London, but seldom lasts for any great length of time.

Storms.—Storms and heavy gales of wind are principally confined to the winter months. When they arise from the north-east they are almost exclusively confined to the time during which the sun is above the horizon. When they arise from the south-west, they occur whilst he is below it. Hurricanes able to root up trees, blow down houses, roll up lead, and in fact to exercise the full power of those tremendous visitations, happen very rarely, but they are by no means unknown in our climate. Their recurrence does not seem to be more frequent than once in ten years.

A singular connection has been observed between the direction of the wind and the chemical action going on in the strata composing the London basin, to which we have alluded in the previous part of this paper. The sulphuretted hydrogen they give forth is found to issue in the greatest abundance in wet weather, when the wind is from the south and the west; it is the least when the wind is from the north and the east, and consequently the driest.

Mr. Daniell observed very justly, and the observation may well conclude the remarks on our climate, that "the British islands are situated in such a manner as to be subject to all the circumstances which can possibly be supposed to render a climate irregular and variable. Placed nearly in the centre of the temperate zone, where the range of temperature is very great, their atmosphere is subject on the one side to the impressions of the largest continent in the world, and on the other to those of the vast Atlantic Ocean. Upon their coasts the great stream of aqueous vapour, perpetually arising from the western waters, first receives the influence of the land, whence emanate those condensations and expansions which deflect and reverse the grand system of equipoised currents. They are also within the frigorific effects of the immense barriers and fields of ice which, when the shifting position of the sun advances the tropical climate towards the northern pole, counteract its energy, and present a condensing surface of enormous extent to the increasing elasticity of the aqueous atmosphere." When causes so numerous and so powerful act to produce irregularities, it is impossible to do more than state the laws which act over long periods of time. They have only been carefully studied of late years, so that it is probable that many of the generalizations given above may hereafter be considerably modified. But "amidst all the uncertainty and seeming confusion arising from these complications general principles may still be recognised, and it is believed that the more they are studied the more obvious they will appear."

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SECTION 3. GEOLOGY.—The Thames, from its source to its outfall, traverses the series of formations which lie upon the oolites of central England, following in its course a valley which, in its present configuration at least, is, comparatively speaking, modern. Within the historical periods no change appears to have taken place, beyond those produced by the gradual contraction of the width of the stream, especially towards its embouchure; but modern works have brought to light traces of what would induce us to believe that partial modifications had taken place subsequently to the peopling of the island. The configuration of the strata in some of the lower portions of the hydrographical basin, however, indicate that this district must, at a remoter geological epoch, have presented nearly similar outlines to those it does at the present day, although at a much lower level in comparison with that of the ocean. The present course of the Thames, in fact, appears to have been as it were traced out for it, before the surface of the main land assumed its present form.

Geology of the Ridge bounding the Thames.—The outline of the basin may be described thus, commencing from the south-eastern extremity. In the portion between Gravesend and the valley of the Darent, the basin of the Thames is separated from that of the Medway by a ridge of chalk hills, capped by the middle tertiary strata of the eocene formations, which occupy so large a surface round London. The valley of the Darent is, for the lower part, entirely in the chalk, although the river itself rises in an elevated ridge of the lower green sand, which continues the line of demarcation between the two rivers just mentioned. In all probability the tertiary strata were continued across the valley during the epoch of their deposition; and they were carried away by the current which formed the actual watercourse of this transverse valley. The sources of the Darent are near Godstone, and it traverses narrow beds of the gault clay, and of the upper green sand, before entering into that portion of its course where it flows only through the chalk. The ridge of the Thames basin continues to be formed by the subcretaceous formations until we arrive at the neighbourhood of Reigate, where they are capped by the Weald clay, and even for a short distance by the beds of the Hastings sand. One of the branches of the Mole takes its origin from these beds; and they divide its watershed from that of the Ouse.

The ridge of the basin then abruptly bends in a direction north-west by west, and is covered by the Weald clay and the lower green sands, which formations prevail in those portions of the district through which runs the affluent of the Wey, passing near Godalming. This portion of the boundary ridge divides the watershed of the Wey from that of the Arun, and pours its waters towards the north in rather a less degree than to the south.

The upper green sands form the boundary of the basin in that portion drained by the branch of the Wey which runs near Guildford, through Farnham, from near Alton. Near Alton they appear to have been removed, for we again find the chalk, which continues to form the surface of the hydrographical basin, with an elevated ridge of an irregular outline, and a direction nearly due west, through Whitchurch, Marlborough, &c., to near Calne, in Wiltshire. The affluents of the Thames we have mentioned as flowing from the subcretaceous formations in this southern part of its basin, are obliged to find their outlet into the main stream through narrow gorges in the chalk formation, which exhibits in this part of England very distinct traces of great and regular disturbances. An inspection of any geological map will show that at some antecedent epoch the chalk must have formed the boundary of two estuaries, situated on what now constitute the eastern and the south-eastern shores of England, with a third basin towards the south. The outlines of these estuaries are formed by very distinct ridges in the chalk, one of which, bounding the basin of London clay, known specifically by the name of the London basin, crosses England in nearly a straight line from Dover to near Devizes, running due east and west. It then turns off at an angle of about 35°, and runs again nearly in a straight line, in a direction about north-easterly, to the sea shore, between King's Lynn and Cromer; forming the two sides of a triangle, now filled in by the London clay. The other basin on the south is nearly parallel to this, or at least the outline of the chalk ridge, which bounds it to the north, is parallel to that of London. It begins on the sea shore near Eastbourne, runs through Winchester, Shaftsbury, to near Beaminster, and then returns at a sharp angle towards the sea near Dorchester, inclosing the narrow basin of the eocene formations, known as the Hampshire basin. The south-eastern basin, or ancient estuary, appears to have been filled up under different cosmical circumstances, and to have owed its separate existence to movements in the chalk which took place in a different direction to those forming the outline of the eocene tertiary basins. The antiquity of the Wealdean formation is supposed to be greater than that of the London clay; and on the south-eastern coast of England it occupies the region between the two parallel ridges of the chalk above mentioned, being bounded on the west by a transverse ridge joining those running from the east to the west.

Resuming our description of the boundary of the basin of the Thames, we find that it is formed near Calne by the lower green sands, and that soon afterwards the middle oolite rises to the surface, giving place to the lower division of that series which continues as far as the head of the Colne near Brockworth. The direction of this ridge is nearly north; thence it diverges towards the east to the sources of the Charwell, continuing in the district of the lower oolite. From the sources of this river the ridge bends in a southerly direction to the neighbourhood of Twyford in the middle oolite; thence it runs easterly round the sources of the Thame, passing through the upper oolite, and the lower green sand. The chalk formation then again forms the bounding ridge, which separates the valley of the Thames from that of the Ouse and its affluents. It continues in an easterly direction, bearing rather towards the north to beyond Buntingford, bending round the sources of the Lea, and the Stort. The direction of the ridge then becomes southerly, and is entirely formed by an elevation of the London clay, passing through Dunmow, Great Waltham, Chelmsford, Billericay, to near Grey's Thurock, where the chalk reappears.

Areas.—In so irregularly defined an area it is almost impossible to ascertain with precision the relative surfaces occupied by the different formations. The difficulty is increased by the number of the strata which outcrop in some portions of the district, and the very narrow zones they occupy in regions where the perfect cultivation of the soil renders it impossible to make very accurate investigations. If, however, we assume the total surface of the hydrographical basin of the Thames as being 6025 square miles, we may calculate that the oolitic formations occupy 2000 of them; the cretaceous formations 1925; and the tertiary formations 2100 square miles. In this calculation we have neglected the subdivisions of the different groups, for the reasons above stated.

Geology of the Watercourses.—Following the courses of the affluents of the Thames, we find that the rivers which rise above Lechlade take their source in the lower oolite of the Cotswold Hills; excepting the Key, which rises in the Oxford clay, and the Cole, which is furnished from the impermeable strata of the gault. From Lechlade the course of the river is in the Oxford clay, to a point near the junction of the Charwell, which, after rising in the lower, traverses the middle oolite for a short distance, and then joins the Isis, after traversing, like it, the Oxford clay. The Isis thence continues in the upper oolite, or the Kimmeridge clay, for some distance; then it winds its way through the gault to a point at Shillingford near Dorchester, where the Thame, whose origin and course are nearly all in the upper oolite, falls in. The Ock has its course entirely in the upper oolite.

The Thames then flows through the subcretaceous green sand formations as far as Goring; and there it traverses a gorge in the chalk, and continues at the bottom of a valley in that formation to Bray, near Windsor, receiving in its way the Kennet, whose origin is entirely in the chalk, and whose valley is covered by a red clay, probably derived from the destruction of the strata which occupied the position of the existing valley, or from the drift to be noticed hereafter.

The course of the Thames thence to its embouchure is entirely through the tertiary formations. The alluvial deposits, however, assume, near Fulham, so great importance as almost to be entitled to be considered a distinct formation. Before arriving at that point, however, the Loddon, whose entire course is in the London clay, falls in; then the Colne, from the chalk, traversing near its junction the lower tertiaries; then the Brent, from the blue clay only; the Wey and the Mole from the subcretaceous formations, and which, as said before, force their streams through gorges in the chalk into the tertiary valley; then the Wandle, which flows entirely through the clay; bear down to the Thames the waters which flow from their respective districts. The Lea rises in the chalk, but the more important part of its course is in the tertiary formations; the Ravensbourne, the Roding, the Ingerburn, and the eastern affluents on the north banks of the Thames, are entirely furnished by the London tertiaries. The Darent, and its confluent the Cray, traverse that formation only for a very short distance after leaving the valleys in the chalk through which they flow from the bounding ridge.

The parallelism of the more ancient strata in their course from sea to sea is very remarkable, although there necessarily exist very great flexures, and irregularities in the details of their outlines. Their recurrence in the opposite portions of the European continent has also an interest to the geological observer, as indicating the outlines of the ocean, at whose bottom the cretaceous formations were quietly deposited during the countless ages necessary for the development of such extensive phenomena. The alternations of chemical and mechanical action evinced by the different natures of the strata, the traces of frequent changes of level both by elevation and subsidence, render the examination of this branch of the science of the highest interest.

Oolitic Formations.—The district which forms the hydrographical basin of the Thames does not in any part touch upon the main division of the secondary strata known as the lias, although in many cases it approaches it very closely, and a detached outlying patch of the lias occurs not far from the head of the Evenlode. The elevation of the oolites is not very great, and the outlines of the hills (wherever they do exist) are rounded, with a gentle inclination towards the valleys, especially on the eastern side. The highest point in the Cotswold range, near the sources of the Colne, is 1134 ft. above the mean level of the sea. The Broadway Beacon is 1086 ft.; the extreme height of the spur which divides the valley of the Windrush from the Evenlode is only 883 ft. high. The range of hills known as the Edge Hills, between the heads of the Evenlode and the Charwell, does not exceed 686 ft.; and the central table land forming on the north the watershed of the Nen, and that of the Charwell on the south, is only 366 ft. above the sea. From this cause the execution of the navigable canals between the various basins of central England was rendered comparatively speaking easy, and free from expensive works.

The strata of the oolitic series are worked to some extent for the purpose of supplying building stone, and lime for local demands; the qualities of those found in the precise localities comprehended in the basin of the Thames are not, however, such as to cause them to be much sought after for the use of the metropolis. The only stones, in fact, which are known in the London market as coming from this geological district, are the Painswick and the Ketton stones, although the Bath and the Portland oolites are both furnished from other portions of the oolitic formations. In the Oxford clays the septaria are met with in considerable quantities, but hardly under the conditions requisite for their being profitably converted into cement. Hydraulic limes might be obtained from some of the argillaceous beds in the proximity to the Oxford and the Kimmeridge clays; but sufficient attention does not yet appear to have been devoted to this branch of economic geology.

The fossil remains contained in the oolites of central England are so thoroughly described in the scientific treatises upon geology, that it would be presumptuous to endeavour to condense what has been written on the subject, in our necessarily imperfect sketch. The occurrence of the jaw-bones of the Didelphys in the Stonesfield slates is, however, of too great interest not to be mentioned. These specimens are the only authentic ones known by which the existence of viviparous mammalia, during the secondary periods, is demonstrated; and they are the more remarkable that, although five jaw-bones have been discovered, no other remains of the animals are to be met with. In the formations of a more recent date, also, there is a complete absence of mammalian remains until we arrive at the tertiary epoch. The jaw-bones alluded to are found in the Stonesfield slates worked near Oxford, in the Cotswold Hills.

Subcretaceous Formations.—The oolitic strata dip in all directions, in a kind of basin-like form, immediately covered by the cretaceous formations, divided by geologists into the subcretaceous deposits and the chalk proper. The former outcrop, as we have seen, over considerable areas of the district under our notice, being separated from the oolites by the Weald clay and the Kimmeridge clay. These beds, being impermeable, hold up the waters which filtrate through the exposed surfaces of the subcretaceous formations, constituting these latter into subterranean reservoirs of water, from which, as Mr. Prestwich justly observes, it is very probable that a large supply might be obtained by means of artesian wells. Geologists classify the subcretaceous beds as follows:—Firstly, and immediately upon the upper members of the oolitic series, we find the lower green sand of very variable thickness. Secondly, the gault clay, interposed between the upper and lower green sand, which last forms the third member of the series, and immediately underlies the chalk.

Mr. Prestwich describes the lower green sand as consisting of a series of beds of loose sands and soft sandstones, with subordinate beds of clay, and groups of argillaceous strata; the sands, however, on the whole predominate largely. It thins out from east to west; for at Hythe, according to Dr. Fitton, it is 406 ft. thick, whereas at Devizes it is only from 13 to 20 ft. thick. At this latter place its superposition upon the Kimmeridge clay and the oolite may be distinctly observed.

Wherever the gault outcrops between the sands of the subcretaceous formations it forms valleys which, when uncultivated, are covered by rushes and plants affecting low and damp situations. It is sometimes laminated, and often the planes of its deposition are traceable by interposed beds of sand, or by courses of small nodules. Its mineralogical composition may be regarded as being a calcareous loam usually of a blue colour; sometimes it attains a thickness of about 100 ft. In the basin of the Thames it does not appear to be worked for the purposes of commerce.

The upper green sand, in this differing from the lower, augments in volume as we proceed from east to west. At the first points where its thickness has been ascertained, viz., at Godstone, it is from 20 to 30 ft. thick; at Farnham it is nearly 100 ft.; near Wallington 70 ft.; at Wantage 100 ft.; in the vale of Pewsey, and at

Devizes, 140 ft., according to the researches of Mr. Prestwich. It is very uniform in its lithological structure: the upper division consisting of sands, occasionally mixed with clay; the lower, of soft, thin-bedded, or fissile calcareous sandstone. At Godstone this is quarried to a considerable extent, and used under the name of firestone, in the construction of such works as are required to resist a moderate open fire. At Mitfield and at Reigate are outlying deposits of fullers' earth, varying from 7 to 17 ft. in depth, and which have been worked for many years. They contain occasionally crystals of the sulphate of barytes. Near Farnham the upper green sandstones are quarried for building purposes; but it is to be observed that they assume there the character of argillaceous limestones. Near the same town of Farnham the green sands and the gault, where it appears, contain nodules of phosphate of lime, which are sometimes used in agriculture as a substitute for bone-dust.

The characteristic fossils of the subcretaceous formations are, the Exogyra sinuata, the Nucula pectinata, Inoceramus concentricus, Plicatula placunea, the Scaphites, species of Turrilites, Baculites, and the Ammonites monile. The teeth of sharks are also of frequent occurrence.

At Woburn there is also a detached outlier of fullers' earth, which is worked to a considerable extent. Rather to the north-west of Thame is a pit from which ochre is obtained; and at Croydon, in the same geological division, is a quarry from which a kind of fire-clay is obtained.

Chalk.—The chalk formation is superposed on these beds of sand, from which the main body of the chalk is separated by a bed of chalk-marl, of a light gray colour, inclining to brown, frequently stained by the presence of oxide of iron. It is usually soft and friable; and it consists principally of carbonate of lime and alumina, with an intermixture of silica. A small proportion of iron, and occasionally of oxide of manganese, are also present. Sulphuret of iron and spicular crystals of carbonate of lime are also frequently to be met with.

The chalk-marl is extensively quarried for the purpose of supplying the London market with lime. The quality it produces is, on the average, a moderately hydraulic lime, of which that furnished by the neighbourhood of Merstham and Dorking are characteristic samples. Smeaton mentions that he employed, in some of his canal works, a lime, from his description, far superior to those just mentioned, obtained by the burning of a variety of the chalk-marl found near Guildford, and known by the local designation of clunch. With the present facilities for its transport offered by the railways and canal, it were to be desired that attention were again called to it.

The chalk itself is somewhat arbitrarily divided by the geological writers into the upper, middle, and lower chalk; although it is extremely difficult to say decidedly where the one begins or the others end. The most natural division seems to be, that of the chalk without flints, the lower and harder beds, which are also less white, and sometimes varied by green or red grains; and of the chalk with flints, the upper and softer series. The latter is of a purer white and of a softer texture than the inferior strata, but in other respects presents no sensible difference. It is regularly stratified, and separated by horizontal layers of silicious nodules into beds, that vary from a few inches to several feet in thickness, and which are traversed by obliquely vertical veins of tabular flint, that may be traced for many yards without interruption. These are sometimes disposed horizontally, and form a continuous layer of thin flint of considerable extent. To continue the description so elegantly given by Dr. Mantell, "The nodular masses of flint are very irregular in form, and variable in magnitude—some of them scarcely exceeding the size of a bullet, while others are several feet in circumference. Although thickly distributed in horizontal beds or layers, they are never in contact with each other, but every nodule is completely surrounded by chalk. Their external surface is composed of a white opaque crust; internally they are of various shades of gray inclining to black, and often containing cavities lined with chalcedony and crystallized quartz."

The minerals of the chalk are confined entirely to isolated specimens of quartz and chalcedony, with occasional nodules of the sulphuret of iron. The animal remains, on the contrary, are very numerous. They consist of zoophytes; bones, palates, and scales of fish; not less than 300 species of shells, mostly pelagian; traces of confervæ and fuci; water-worn and worm-eaten fragments of dicotyledonous wood; bones and teeth of several oviparous quadrupeds, but none of mammalia. Commercially, the chalk is quarried for the purpose of making lime, the qualities of which, as is well known, are only adapted for internal works. Occasionally the chalk becomes harder and denser in its grain, and is then used as a building stone in the localities in which it is found. The conversion into lime is, however, the principal use to which chalk is turned in our country, for which its superior adaptation to agricultural purposes renders it a highly important mineral production.

The hills of the chalk are not very lofty, and they are easily distinguishable in a landscape by the rounded form, and the absence of abrupt escarpments in their outlines. The greatest elevations they attain in the valley of the Thames are, in the Chiltern range, at Kensworth Hill, of 904 ft., and at Nettlebed Hill, of 820 ft. above the sea, respectively. In the North Downs, Inkpen Beacon attains a height of 1011 ft.; Hind Head, of 923 ft.; and Leith Hill, 993 ft.

From the peculiar mechanical structure of the chalk, in such places as it is exposed, if the rain-water is not immediately thrown off by the declivity of the valleys, it is rapidly absorbed into the body of the formation. Wherever, then, the chalk is not covered with beds of drift clay, the streams it furnishes are few, and insignificant in volume. Compared with the other formations, certainly the chalk, area for area, yields less to the river than they do. The affluents of the Thames which are furnished by it, we also find to run through valleys in which the drift clay occurs to a great extent, as in the case of the Kennet, the Colne, and the Lea. In the valley of the Kennet, we may also mention that large beds of peat are met with, and that they are worked to some extent near Newberry.

The existence of the impermeable bed of chalk-marl under the main body of this formation also has a considerable influence on the formation of springs in the valleys where it is exposed. In the cases in which the marl outcrops on the hill sides, the waters, filtering through the superincumbent mass of the chalk, work their way through the portions immediately upon the marl; for the nature of that stratum opposes itself to their further descent, and the hydrostatical pressure upon the upper waters forces them to flow away at the points in which there is no counteracting resistance. We thus find in many of the chalk valleys that copious perennial springs are to be met with; even though the hills which surround them become perfectly dry immediately after a fall of rain, however copious.

London Clay.—The chalk formation is immediately covered, in the basin of the Thames, by a considerable deposit, classed by modern geologists in the eocene tertiary series. It is of very considerable thickness, and, as we have before seen, it performs an important part in the hydrography of the district, from the extent of country it covers, and the manner in which it throws off the surface waters. The name of the London clay has been applied to the whole division, which is capable of subclassification into, firstly, the plastic clays; and secondly, into the London clay proper.

The plastic clays immediately overly the chalk, and are met with in various thicknesses, wherever that formation outcrops from under the tertiaries. The character of the plastic clays is not uniform, for, again to quote the words of Mr. Prestwich, "it exhibits in many places variations in its structure and fauna." In the neighbourhood of Newberry and Reading are mottled clays, interstratified with beds of sand, and generally underlied by a bed abounding with the Ostrea bellovacina. At Woolwich, Charlton, and Bromley, the chalk is overlied by unfossiliferous sands, succeeded by a mixed series of clays and sands with flint pebbles, and containing many organic remains of fresh water and estuary origin. At Herne Bay and in the Isle of Thanet there exists a thicker and more important series of sands, sometimes in part very argillaceous, at others much mixed with green sand, and many of the beds of which abound with marine fossils—the fluviatile beds of Woolwich, and the mottled clays of the western districts, having in these places completely disappeared.

The plastic clay formation is most largely developed in the eastern portion of the basin of the Thames. In passing under London its composition changes very materially from what it is in the north-east of Kent, and its united thickness diminishes until it arrives at the extreme western outcrop. The greatest thickness in the portion first named is about 120 ft.; under London it is 75 ft.; at Claremont 60 ft.; and finally, at Hungerford, 48 ft. It is from the beds constituting this formation that the artesian wells of the metropolis derive their supplies; but Mr. Prestwich accounts for their small value by the fact, that the uninterrupted flow of the water is prevented by two lines of disturbance, or faults, which traverse the district nearly at right angles one to another.

The fossils of the plastic clay consist of numerous species of testacea, and occasionally the bones of vertebrated animals, such as reptiles or fish. In the London basin no traces of mammalia are to be met with, though in the Isle of Wight bones of the Anoplotherium have been found. Fossil plants, in the form of lignites, are sufficiently common.

Commercially, the plastic clay formations furnish earths admirably adapted for the manufacture of pottery; and it is to their adaptation to such purposes that the whole series owes its name. The sandy loams, also, are much used by iron-founders, for the purpose of making the moulds into which the iron is run from the furnaces. The plastic clay does not offer any hills worth our notice.

Upon the beds of the plastic clay those more particularly known by the designation of the London clay are deposited, in a manner usually conformable. It may be defined as a mass of dark-bluish clay occasionally brown at the outskirts, evidently of an origin similar to what we can now trace in estuaries; of very great extent and considerable thickness. Some of the lower beds assume at times different characters, and are yellowish-white, or variegated, unctuous, laminated, and in their chemical position partake of the nature of calcareous marls. The upper beds are most frequently brown, and near the top mixed with light-coloured sands, in sufficient quantities to form a good brick earth without mixture, the middle beds being mostly bluish-gray, as before said. Green sands are occasionally interspersed, at others rounded flint pebbles also, in these lower parts of the formation. The colour of the main body of the clay often becomes brown, with an appearance of being bedded, and with nodules of septaria dispersed in layers over a considerable extent. The fossils contained are very numerous and beautiful, especially near the Island of Sheppey, where the continual inroads of the sea expose them in great abundance. Sir C. Lyell states that as many as from 300 to 400 species of testacea are found in the London clay;

an immense number of the ligneous seed-vessels of plants, of species now confined to tropical regions, and the bones of crocodiles and turtles, are also found in it, but no remains either of mammalia or of birds were discovered until of late years. Professor Owen has, however, recognised the bones of Quadrumana in some positions of the clay. The nodules of septaria are collected to a very great extent upon the shore of the Isle of Sheppey, for the purpose of making the Roman cement so much used in engineering and architectural works. Mineralogically, the septaria may be defined as being an argillaceous carbonate of lime, traversed by veins of crystallized carbonate of lime; it is either of a bluish or an ochreous-brown colour, according to the strata in which it occurs. Crustaceous fossil remains are often inclosed in the nodules.

The Island of Sheppey also yields large quantities of the proto-sulphate of iron, or the absurdly-named copperas of commerce. It is used principally in the manufacture of ink and of prussian-blue. The sulphuret of iron is also found in the London clay, but hardly in sufficient quantities to render its extraction of commercial value. Crystals of the selenite, or the starry gypsum, frequently occur, but that mineral is also very irregularly distributed, nor is it met with in such proportions as to be of use. When the London clays are of a red colour, from the presence of ochreous iron, they are used for the manufacture of bricks.

The elevations of the hills in the London clay of the basin of the Thames in no case exceed 620 ft., which is that of Langdon Hill in Essex. In Epping Forest there is also a hill 390 ft. high; and at Highgate the clay, capped by the Bagshot sand, attains a height of 450 ft. above the mean level of the sea. The outlines of these hills are even more rounded than those of the chalk, and the valleys are also less precipitate in their falls. The effect of these conditions of form, combined with the retentive nature of the material, is to render the London clays more adapted to furnish the supplies of water they derive from the rain-fall to the rivers. It is indeed characteristic of this group, that it throws off a greater number of streams in proportion than any other. But, at the same time, we must observe, that if no outfall be given to the surface water, and it cannot escape through the land, but lies upon it, the London clay is marshy and unhealthy. The extreme thickness of this formation is supposed to be about 620 to 650 ft.

The London clay is covered in some portions of its area by a series of beds called the Bagshot sands, which lie conformably upon it in the district beginning near Esher and Claremont on the east, to Heckfield and Strathfieldsaye on the west. They extend from near Farnham on the south, to Wokingham on the north, with outliers on the top of Hampstead Hill, Harrow, Highgate, as also near Epping, Havering-atte-Bower, Brentwood, Langdon, and in the neighbourhood of Rayleigh, near Southend. This series consists of a mass of unfossiliferous silicious sands, with occasional subordinate beds of fossiliferous green sands and marls at their base. They usually form barren sandy districts, rising over the greater part of the area they cover into ranges of moderately-elevated heath-covered hills. At the outcrop of some of the clays and marls of the lower division, and also at the outcrop of the green sands and argillaceous marls of the middle division, the country is, however, remarkably fertile. These portions are, however, very limited in their area, when compared with the surface of the sands.

The area of these formations has been stated lately, by the very equivocal authority of the Board of Health, to be 150 superficial miles; the best geological maps make the area much less, even including the great outlier of Hampstead and Highgate. The total thickness ranges between 400 and 500 ft., but it is hardly ever found to exist in its full extent.

Mr. Prestwich divides the whole formation into the three following groups; viz.:—

1stly. The lower Bagshot sands, varying from 100 to 150 ft. in thickness, which occur near Woking, Weybridge, Virginia Water, Claremont, Cobham, Ripley, Ascot, and at the bottom of Hampstead Heath. They are composed of whitish and light-yellow fine silicious sands, frequently micaceous, occasionally argillaceous, with a few seams of pebbles, and mere traces of organic remains.

2ndly. The middle Bagshot sands, from 40 to 60 ft. thick. They are most extensively developed near Addlestone and Chertsey, at Shapley Heath, Swinley, Bagshot, Chobham, Ascot, and covering the top of Hampstead Heath, &c. They consist of a few beds of different coloured sands and clays, with one or two beds of green sand containing lignite in the lower beds.

3rdly. The upper Bagshot sands, from 200 to 300 ft. thick, which are met with near Chobham Place, Frumley Heath, Bagshot, Hartford Bridge, and Sandhurst. They consist of irregularly-bedded sands of a light-yellow colour, occasionally tinged with shades of green, red, and ochre.

The rare fossils contained in this bed led Mr. Prestwich to assign it a date posterior to the London clay, but anterior to the pleistocene drifts, which cover that formation in other places.

These pleistocene drifts, or, as they used to be called, diluvial deposits, are dispersed irregularly over the valley of the Thames throughout nearly the whole of its course, and were apparently brought from some elevated region towards the north and east. They are found at Maldon, Kelvedon, Braintree, Ilford, Gray's Fenney, Stratford, Leighton Buzzard, Finchley, and Muswell Hill, the Isle of Dogs, Erith, Brentford, and at other points in the upper valley of the Thames. Sir C. Wren, in his "Parentalia," describes a set of beds existing under the foundations of St. Paul's of precisely the same nature. They consist of a light clayey sand and ferruginous gravel, with boulders of quartz and granitic rocks; portions of all the rocks of the secondary strata, with their characteristic fossils; boulders of the London clay septaria, bored by teredinæ. These beds are not present in all cases, in others they are replaced by those which cover them when the series is complete, and which consist of a set of beds of sands and light-coloured clays and gravel, containing bones and shells; the whole being often covered by a bed of brick earth about 4 ft. in thickness. It is to be observed that the bones and shells are far from being confined to any one of the members of the series, though they appear to be most numerous about the centre. They are highly interesting, inasmuch as they contain the remains of elephants, mammoths, aurochs, elk, reindeer, rhinoceros, hippopotamus, tiger, &c., in connection with a large number of our present indigenous fluviatile and terrestial mollusca.

In some localities the fossil remains of the period of deposition are wanting, and the drift consists entirely of the *débris* of the more ancient strata. Thus, at Muswell Hill, we find masses of chalk, chalk flints, primary and secondary rocks, and fossils of nearly every formation. In others the drift consists chiefly of stiff blue and yellow clay; in others it contains or rests on beds of sand and gravel, and is often overlied by a deposit of sand, gravel, and chalk flints, exceeding 50 ft. in thickness. The district over which this drift extends comprises not only the main valley of the Thames, but also the subsidiary valleys of its affluents, such as the Wey and the Mole.

The heights attained by these more recent deposits are inconsiderable; the highest points being near Winchfield, where the Bagshot sands are 250 ft. above the sea; at Bagshot Heath, the most elevated portion of which is 463 ft.; and, as said before, Highgate Hill, 450 ft. high.

The banks of the Thames immediately upon the present course of the river, after passing Fulham, and continuing thence to the Nore, are formed in the alluvial mud of the existing era in geology. There would appear to be strong reasons for believing that the relative levels of this portion of the river have been considerably modified, either by the subsidence of some portion of the ancient river bed, or by the rapid elevation of it within the period in which the human race have occupied the island. We find that subterranean forests exist at Purfleet, Grays, Dagenham Marsh, and Tilbury Fort. In the Isle of Dogs a forest of this description was found at 8 ft. from the grass, consisting of elm, oak, and fir-trees, some of the former of which were 3 ft. 4 in. diameter, accompanied by human bones, recent shells, but no metals or traces of civilization. The trees in this forest were all laid from the south-east to the north-west, as if the inundation which had overthrown them came from that quarter. At the mouth of the Thames we also find the singular bed apparently due to the accumulation of aquatic plants and the exuviæ of marine infusoria which Ehrenberg calls the Darg.

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SECTION 4. NATURAL HISTORY.—The Flora and the Fauna of a country like England, which has been for so many years the scene of the persevering exertions of perhaps one of the most energetic races which have figured upon the globe, must necessarily have suffered modifications so great as almost to defy our attempts to ascertain what they were originally. New races of plants and animals have been introduced; old ones have disappeared; according to the wants or the whims of men. Indeed, to such an extent has this been the case, that the parent stocks have either been lost altogether, or so much modified as hardly to be recognisable in many instances, or their places have been supplied by more productive varieties from other climes. The changes in the Flora are perhaps the most extraordinary; we will then examine them in the first instance, especially as the other divisions of organized life are so intimately connected with it.

The Flora.—According to Mr. Loudon's summary, given in his very beautiful and elaborate work upon the Arboretum and Fruticetum Britannicum, "the indigenous plants which might be classed as trees or shrubs consisted of 71 genera and 200 species. Nearly 100 of these are willows or roses; and the whole number of species are capable of being comprised in 37 groups or natural orders." In detail, they consist of—

27 deciduous trees, including 4 species of *malus*, from 30 to 60 feet high on the average.
28 deciduous trees, whose height varied from 15 to 30 feet.
1 evergreen, the Scotch pine, from 60 to 80 feet high.
3 ditto, the box, the yew, and the holly, from 15 to 30 feet high.
65 deciduous shrubs and very low trees, from 5 to 18 feet high, including 21 roses and 32 willows.
26 deciduous shrubs, from 1 to 5 feet, including 6 roses and 10 willows.

5 evergreen shrubs, from 5 to 15 feet high.
7 ditto ditto, from 1 to 5 feet high.
1 evergreen climber, the ivy.
1 deciduous climber, the *clematis vitalba.*
2 deciduous twiners, the honeysuckles.
8 evergreen twiners, the brambles.
3 deciduous shrubs, the *rosa arvensis, solanum dulcamara,* and *rubus cæsius,* from 6 to 12 inches high.
13 evergreen shrubs, from 6 to 12 inches high.
10 deciduous shrubs, from 3 inches to 1 foot.

In the whole range of the native Flora, it is believed that no less than 3300 to 3400 species are to be found, of which 1437 are of the cotyledonous tribes, and 1893 of the acotyledonous. The former are comprised in 23 classes and 71 orders, the latter in 8 classes and 121 orders. Amongst the cotyledonous plants, in addition to the 200 species of trees and plants above mentioned, there were 855 perennials, 60 biennials, 340 annuals.

Amongst the perennials there were 83 grasses, principally belonging to the second division of the order *gramineæ*, characterised by a panicled inflorescence; the gramineæ also form a very considerable proportion of the biennials and of the annuals.

Amongst the acotyledonous plants it is supposed that the native Flora included 800 fungi; 18 algæ; 373 lichens; 85 hepaticæ; 460 musci; 130 filices.

There were 18 sorts of edible wild fruits in the island at the period of the Roman invasion; 20 sorts of culinary plants; 20 sorts of spinaceous plants; 3 fungi; 8 species of algæ, even now eaten occasionally; with 6 sorts of wild flowers retained in the cultivated Flora of the present day. The cultivated corns of the present day are nearly all of foreign introduction; for although we possessed several species of the barley (*hordeum*), and the oats (*avena*), they were not such as were adapted for food.

The Romans carried into Britain, as they did into all the other countries they subjugated, an improved system of agriculture, and a vast accession to the Flora. It is to that wonderful nation that we are indebted for the plane tree, the lime, the elm, and several species of the poplar. Apples were grown in Britain before their arrival, but they introduced the pear, the damson, the cherry, peach, apricot, quince, mulberry, fig, medlar, walnut, sweet chestnut, the true service tree, many varieties of the rose, the rosemary, thyme, and arbutus and sweet bay. The greatest advantage our islands derived from their occupation is, however, without doubt, the introduction of the wheat (*triticum hybernum*), which appears to have followed their progress throughout the world.

In the dark ages of the Saxon period, the British Islands, like the rest of Europe, unfortunately only retained such traces of the Roman civilization as the monks could preserve under their protection.

Agriculture suffered like all other branches of refinement. The monks appear, however, to have cultivated nearly all the trees and plants the Romans had introduced, and they are known to have been acquainted with the following trees and shrubs:—the birch, the alder, the oak, the wild or Scotch pine, the mountain ash, the juniper, the elder, the sweet gale, the dog rose, the heath, the St. John's wort, and the misletoe.

The introduction of foreign plants seems to have taken place very slowly for many years after the Conquest, for in the 16th century we find that only 89 foreign woody plants were known to be cultivated in Britain, exclusive of two varieties of laurustinus. In the 17th century, the example set by Sir Walter Raleigh and Gerard appears to have produced some effect, for about 131 woody plants were introduced. In the 18th century greater progress was made, for 445 trees and shrubs were added to our arboretum; and in the first thirty years of the 19th century, not less than 699 were introduced. The efforts of Tradescant, Ray, Bishop Compton, and Evelyn, in the 17th century, contributed to these results, whilst in the 18th, Parkinson, Sutherland, and others, laboured heartily in the cause. Their efforts were assisted by the formation of the magnificent gardens of Chelsea, Syon, Fulham, Kew, Woburn, Chiswick, Mount Edgecomb, and many others dispersed over the country. But about one-half of the foreign trees and shrubs which now appear in the lists of our arboretums, have been introduced within the present century, and they are nearly all natives of North America. Amongst them not more than 300 attain the dimensions of timber trees, and of these the larch is by far the most valuable. A few of the trees came from Europe, but the bulk of them were furnished by the North American continent, which has been perhaps more thoroughly explored than the other thinly inhabited parts of the globe. The Duke of Marlborough appears to have aided the progress of our botanical acquisitions more than any other patron of the science, by the princely scale upon which the gardens at White Knights and at Blenheim were conducted. At the former establishment, near the town of Reading, that nobleman had collected an inestimable series of magnolias; the largest assemblage of the genus pinus in England; many species of the acer; fine specimens of the arbutus, æsculus, pavia, kolreuthia, &c. The other amateur botanists followed eagerly in the path thus traced for them, and it is principally owing to the exertions made since the beginning of the century, that we are indebted for the unrivalled collections at Dropmore, Hylands, Bishop's Stoke Vicarage, Cheshunt, Cobham Hall, Barton Hall, Bagshot Park, Oakham Park, and Deepdene. The botanical gardens at Chiswick and in the Regent's Park; the establishments of such eminent horticulturists as the Loddiges, at Hackney; Donald's, near Woking; Buchanan, at Camberwell; Lees, at Hammersmith; Osborne, at Fulham; Knight, in the King's Road, Chelsea; Young, at Epsom; &c., have aided to naturalize an immense number of the new plants thus introduced.

The results obtained from the combined efforts of all these labourers in so good a cause, have been to augment the artificial Flora of the British Islands to such an extent, that the combined numbers of the native and artificial Floras ars not less than from 17,000 to 18,000. It has been ascertained by Mr. Loudon, that of the additions to the collection, the sources of supply might be grouped as follows;—

From the European continent	4,169	species.
„ „ Asiatic	2,365	„
„ „ African	2,639	„
„ „ North American	644	„
„ „ South American	2,353	„
Native countries unknown	970	„
Total	13,140	

in which number are included 370 different sorts of hardy trees, supporting the vicissitudes of our climate; 100 of that number being trees from 30 to 60 ft. high, and the remaining 270 trees from 10 to 30 ft. high. Four hundred hardy grasses are also included in the above total.

Of course, in so large a collection of foreign plants, it is not to be expected that all would thrive equally well. It is supposed, in fact, that no more than the following numbers of the different divisions can be procured in the nursery gardens:—

Hardy plants	4,580
Green-house plants	3,180
Hot-house plants	1,463
Annuals	820
Total	10,043

counting all the species and varieties. These include 1906 varieties of fruit trees, 154 species and 337 varieties of esculent herbaceous plants, and 2666 species and varieties of flowers.

Now, if we proceed to examine in detail the Flora of the district round London, we may consider it, firstly, as regards the production of human food; secondly, as regards the forest trees; and, thirdly, as regards the wild flowers, grasses, mosses, &c.

However we may classify the separate kinds of plants, it cannot be denied that, to us at least, the production of either the grain we eat or the grasses necessary for the support of the cattle we consume, is the most important function of the vegetable world; and it is for this reason that we consider such plants before the others. We find thus that, in the agricultural district of the valley of the Thames, the corns grown consist of seven species or varieties of wheat: viz., the *triticum æstivum*, or spring corn; the *t. hybernum*, or winter corn; *t. compositum; t. turginum; t. polonicum; t. spelta; t. monococcum*. Originally, as has been before observed, we were indebted to the Romans for this inestimable grain; many new sorts have been tried of late years, but those above enumerated are the most esteemed. Of the ryes, supposed originally to have come from Crete, only one variety, the *secale cereale*, is cultivated. Six varieties of barley are planted: the *hordeum vulgare*, common spring barley, supposed to be a native of our islands; the *hordeum celeste*, or Siberian barley; *h. hexastichon*, the winter barley; *h. distichon*, the common long-eared barley; the *h. distichon nudum*, the naked-eared barley; and the *h. zeocriton*, the sprat barley. Amongst the oats the *avena sativa*, or the white oats, are those most raised. Attempts have been made to introduce the *zea mays*, or the maize, but they do not appear to have succeeded well in our climate, which hardly attains a sufficiently elevated temperature to ripen it, as was predicted that it would. In the Isle of Thanet, the canary corn, or *phalaris canariensis*, is largely grown; the millet, or *panicum*, is also raised. The white and black mustard, the *sinapis alba* and *nigra;* the buckwheat, or *polygonum fagopyrum;* and the rape seed, or *brassica napus*, complete the list of the grains usually produced in the valley of Thames.

In the upper valley of its affluent the Wey, the hop, or *humulus lupulus*, is cultivated to a great extent near Farnham, as it is also near Maidstone and Canterbury, in Kent. There are four varieties: the Flemish, Farnham, Goldings, and Canterbury, which are the most esteemed, besides several other local varieties.

Amongst the leguminous field plants, those principally cultivated are, the field pea, or *pisum savitum;* the common bean, or *vicia faba;* the tares, or *vicia sativa;* lentils, or *ervum lens;* and *phasolus vulgaris*, or the kidney bean. Amongst the roots cultivated in fields we may cite the potato, *solanum tuberculum;* the red beet, *ceta vulgaris;* the mangult wurtzell, *beta civa;* the indigenous common turnip, or *brassica rapa*, and its variety the swedes, or *brassica rapa rutabaga;* the indigenous carrot, or *daucus carota;* the indigenous parsnip, or *pastinaca sativa;* the cabbage, or *brassica oleracea*.

The tall hay grasses most commonly cultivated are the varieties of the *lolum perenne,* and its congeners; of the *dactylis*, or cocksfoot; of the *holcus*, or the woolly soft; the *festuca loliacea*, or fescue grass; the *anthoxanthum vernum*, or vernal grass; *alopecurus pratensis*, or meadow fox-tail grass; the *poa fertilis* and *trivialis*, or meadow grass; the *cynosurus cristatus*, or crested dog-tail grass; the *lolium perenne*, or rye grass; the *agrostis stolonifera*, or bent grass; the *phleum pratense*, or cat's-tail grass; and the *avena pubescens*, or the wild oat; being the species most esteemed. The *trifolium pratense;* the *t. medium;* and *t. repens;* or the red, cow, and white clover, of which the latter is indigenous; the *hedysarum onobrychis*, or sainfoin; and the *medicago sativa*, or lucerne; are also grown largely for the purpose of feeding horses and other cattle. Many other varieties of the *trifolium*, of the *hedysarum*, and of the *medicago*, not only grow wild, but are also cultivated; the above named are, however, those most frequently grown near London.

Some other plants, such as the *poterium sanguinisorba,* or the burnet; the *plantago lanceolata*, or ribwort plantain; the *ulex Europœa*, or gorse; the *spergula arvensis*, or spurry; and the *apium petroselinum*, or parsley, are also occasionally grown in large quantities in fields.

In gardens, according to the popular statement of Mr. Loudon, the following plants and trees are cultivated for food, namely, of the cabbage tribe *(brassica qu. oleracea?)* seven varieties, the white, the red, the savoy, the Brussels, the borecole, the cauliflower, and the brocoli. Of the leguminose plants; the pea, the kidney bean, and the garden bean, with their endless sub-varieties. Of esculent roots; the potato, Jerusalem artichoke, turnip, carrot, parsnip, red beet, skirret, scorzonera, salsafy, and the radish. Of the spinaceous plants; the spinach, the orache, white and sea beet, the wild spinach, New Zealand spinach, the sorrel, and herb patience. Of the alliaceous roots; the onion, leek, chive, garlic, shallot, and rocambolle. Of the asparaginous tribe; the asparagus, seakale, artichoke, cardoon, rampion, and alisander. Of the acetarious tribes; the lettuce, endive, succory, celery, mustard, wood sorrel, corn salad, garden cress, American cress, water cress, and the small salads. Amongst the potherbs and garnishings, are the parsley, purslane, tarragon, fennel, dill, chervil, horseradish, nasturtium, marygold, borage, &c. Amongst the sweet herbs, are the thyme, sage, clary, mint, marjoram, savory, basil, rosemary, lavender, tansy, and cotsmary, or alecost. For the uses of confectionery, or medicine, the following plants are cultivated: the rhubarb, gourd, angelica, anise, coriander, caraway, rue, hyssop, chamomile, elecampane, liquorice, wormwood, and balm; the love apple, or tomato, the egg plant, capsicum, and samphire, are also sometimes grown.

The kernel fruits grown are the apple, pear, quince, medlar, and the true service. The stone fruits are the peach, nectarine, apricot, almond, plum, and cherry; the county of Kent having possessed from time immemorial the reputation of producing the best fruits of the latter description. Amongst the berries may be reckoned the berberry, the elder, gooseberry, black currant, red ditto, cranberry, strawberry, and raspberry; the two latter attaining their greatest perfection near London. The nuts grown are the walnuts, chestnuts, and filberts, with all their sub-varieties: the counties of Kent and Hants appear to produce the best filberts.

In frames or in hot-houses are produced pines, grapes, figs, cucumbers, and melons in some abundance; and occasionally a few oranges, pomegranates, olives, and Indian figs. Of the fungi only three sorts are consumed in cookery, viz., the mushroom, the truffle, found under the beech trees of Berkshire, &c., and the morel, found under nearly analogous circumstances.

The list of hardy ornamental flowering shrubs is very extensive, and it receives additions almost every year. The principal ones grown near London are the hyacinth, tulip, ranunculus, iris, pink, dahlia, auricula, primula, carnation, chrysanthemum, rose, pansy, petunia, anemone, crocus, narcissus, fritillary, pœony, camellia, fuchsia, calceolaria, verbona, lily, amaryllis, ixia, gladiolus, rhododendrons, geraniaceæ, &c. Many of these are indigenous, but they have been considerably modified by cultivation. For instance, the *primulæ*, or primrose tribe, the *ranunculi*, or buttercup tribe; the *crocus* tribe; the *fritillaria meleagris*, which grows wild on the banks of the Thames, near Kew and Mortlake; the *convallaria majalis*, lily of the valley, this lovely flower grows wild near Hampstead and Dulwich. Many varieties of the *iris* are also derived from the indigenous wild plants; as are also the *cheiranthus cheiri*, or the common wallflower; the convolvuli, pinks, poppies, eglantine, honeysuckle. Many of the foreign plants of this class have become acclimatised to such an extent as to grow freely without cultivation, the most delightful of which is the mignonette.

The forest trees grown in the valley of the Thames have, like all the other divisions of the Flora, received immense accessions to their numbers of late years. Of the total number of 370 given previously, the greater portion are, however, trees which are only grown in ornamental parks, or in positions where they must be considered to be artificially cultivated. Perhaps that may be the case with all the trees near London to a certain extent; for as there are no woods of sufficient size to superinduce the natural regime of a forest, all our trees must be modified by their comparative isolation. The largest woods are in some parts of North Kent and Surrey; Buckinghamshire and Oxfordshire can produce some tolerably large woods also; but in the other counties included in the basin of the Thames, with the exception of Epping Forest and Windsor, there are few assemblages of trees worthy of more than the name of copses.

The most common forest trees usually grown are, firstly, the lime, or *tilia Europea*, said to have been introduced by the Romans; there are three varieties to be found near London, which thrive well in rich clayey loams, low-lying meadows, and on the banks of rivers. The varieties are the *t. Europea*, *t. platyphylla*, and *t. microphylla;* they frequently attain from 80 to 100 ft. in height. In the sooty atmosphere of London they soon loose their leaves; and, moreover, as they flower late, they are not much planted near the town. The *tilia Americana* has been planted very successfully at White Knights, where it has grown to about 60 ft. in height within a very few years.

The *acer pseudo platanus*, or common sycamore, is of an origin which seems involved in some obscurity. If it be not indigenous, at any rate it ripens its seed in exposed situations, and may on that account be said to be naturalized at least. It is a fine full-sized tree, which reaches its full growth in 60 years, improves to 80 or 100, and decays before attaining 200 years. Some examples have been known whose circumference has not been less than 22 ft. near the ground, and which are supposed to have contained 327 cubic feet of timber. The sycamore is one of the few trees which support the atmosphere of the interior of London. The deciduous bark always looks clean, and the bright colour of its beautiful leaf makes it a deserved favourite in the gardens of the murky town. There are four varieties cultivated in the south of England.

The *acer platanoides*, or Norway maple, and the *acer macrophylla*, from North America, have been introduced of late years.

The *acer campestre*, or common field maple, is usually treated as a bush in the southern counties; but when allowed to grow it is a rather fine tree; it is indigenous. The misletoe is sometimes found upon this species of the maple.

The *æsculus hippocastanum*, or horse chestnut, a foreign tree, introduced about 1550, grows with extraordinary beauty in some situations in the valley of the Thames. It requires a deep fine loam and a sheltered position; and, under favourable circumstances, attains from 80 to 100 ft. in height, with a diameter of from 5 to 9 ft. In Kensington Gardens some very fine specimens are to be found; and in Bushy Park is one of the most magnificent avenues of horse-chestnut trees in the world.

The *ilex æquifolium*, the common or green holly, is an indigenous plant which generally takes the form of underwood to trees of more rapid growth, but at times it attains from 40 to 50 ft. high, with a diameter of from 2 to 4 ft. Evelyn planted it as a close hedge, and attended to it with such care, that at Saye's Court he succeeded in obtaining a hedge 400 ft. long, by 8 ft. high, and 5 ft. broad. It grows well in Buckinghamshire and Kent, in gravelly soils on a substratum of chalk.

The *robinia pseudo acacia*, or false acacia, is the tree Cobbett endeavoured to bring into fashion under the name of the locust. It grows rapidly in the first ten years of its existence; after that period its development is very slow. Several varieties of the pseudo-acacia are grown as ornamental trees; but like all the real acacia tribe they are late in leaf, and the period of fall is early.

The *cerasus sylvestris*, or wild cherry, or gean, is supposed to be an indigenous tree, which in a tolerably dry soil rises to 60 or 70 ft. in height. In woods it is the favourite resort of the thrush and blackcap.

The *cratægus oxyacantha*, white thorn, or hawthorn, an indigenous tree, or one naturalized at least from the time of the Romans, is at the present day only allowed to grow as a hedge plant. In dry, loamy, and slightly gravelly soils, however, it attains the dimensions of a tree if left without being clipped. The tribe of *cratægus* appears to support the London atmosphere tolerably well, and they are on this account often planted in the interior of the town.

The *pyrus ancuparia*, or mountain ash, and the *pyrus alba*, or the white bean, grow well in some positions near London; but are rarely planted otherwise than for ornamental trees.

The *fraxinus excelsior*, or common ash, grows to a very great dimension at Woburn, attaining 90 ft. in height, with a circumference of 22½ ft. at the ground. It comes late into leaf, and is therefore only grown in coppices, or in such places as allow of its being made a commercial tree. The best ash timber grows in free, loamy soils, with a mixture of gravel. In rich soils it is luxuriant, but the wood it produces is shorter and more brittle in grain; in cold wet clays it never attains any size. Some American varieties of the *fraxinus* have been introduced; but they do not support the spring frosts of our climate.

The *ulmus campestris*, or small-leaved elm, grows to a high degree of perfection in the south of England, and is usually planted as a hedge-row tree in the valley of the Thames, rising to from 70 to 90 ft. high, with a diameter of from 4 to 5 ft. We are indebted for this beautiful tree to the Romans; and it was a deserved favourite with the Anglo-Saxons. It comes into leaf early, keeps it late, and stands the smoky atmosphere of our large towns. It will grow upon soils of an inferior description, and of various characters, in light as well as heavy soils, and often best in strong clayey loam, too stiff and adhesive for the *ulmus montana*, or Scotch or wych elm. There are eight varieties of the small-leaved elm in cultivation near London; besides the distinct species of the *ulmus suberosa*, or cork-barked elm, and the *ulmus montana*.

There are only four or five species of willow which attain to the dimensions of trees, out of the 70 species cultivated. A few others attain from 20 to 30 ft. in height; but the bulk of them are only grown under the name of osiers on the river banks. Of the forest trees the most important are the *salix fragilis*, the *salix Russelliana*, the *salix alba*, and *salix caprea*, which attain from 60 to 80 ft. in height. The osier beds of the Thames and the Cam, however, offer a wide field of observation to the botanist, on account of the extraordinary number of these indigenous plants they contain. On the islands of the Thames, between London and Reading, there are many of these osier plantations; but the greatest number, as well as the most perfect specimens of this system of cultivation, are to be found at Reading itself.

The poplar tribe flourish best in moist rich soils, and in the neighbourhood of running waters; in marshes, and soils rendered constantly damp by stagnant waters, they do not thrive so well. There are many indigenous varieties, the most important of which are the *populus canescens*, or gray poplar; the *populus tremula*, or aspen; the *p. alba* or *abele.* The *p. græca*, or Athenian poplar; the *populus nigra*, or black poplar; the *p. monilifera*, or black Italian; the *p. fastigata*, or Lombardy poplar; the *p. balsamifera*, or tacamahac; are foreign varieties which have speedily adapted themselves to our climate. The black poplar yields the best timber; the Lombardy poplar attains the greatest height. It grows occasionally, within 50 years, to as much as 120 ft. in height.

The *alnus glutinosa* is one of our indigenous trees, which grows on the margins of rivers and running streams, and in marshy and damp lands, even in morasses and swamps of the wettest descriptions. A variety called the *a. lanceolata*, or cut-leaved alder, attains frequently 70 ft. in height.

The *betula alba*, or white birch, grows in hilly districts, commons, and wild tracts, where the soil is of a light and sandy nature. The mountain variety, or the weeping birch, grows the fastest, and therefore is the most esteemed. It is planted near London as an ornamental tree in the parks; but is only prized inasmuch as it forms a variety in the landscape; the foliage is very poor and thin, nor does it last as long as many others.

Of the *quercus robur* there are two indigenous species cultivated as forest trees throughout the southern counties, the *q. robur pedunculata* and *sessiliflora.* Botanists are, however, far from being agreed as to the persistence of the specific differences of these divisions. The oak grows best in strong adhesive loams, or good clay soils, more particularly when the substratum is of the latter nature, and the surface water is not allowed to stand at the foot of the tree. The age of the oak is proverbial for its great length; but in the valley of the Thames it is found to be most profitable to cut them at 90 years, although the trees continue to increase in value until they are 120 years old. Celebrated trees of this class have been noticed at Boddington, in Gloucestershire, of 54 ft. circumference; at Hempstead, in Essex, of 53 ft. circumference; at Merton, in Norfolk, of 63 ft. circumference; at Woolton, Michenden, in Buckinghamshire; at Pansangher, in Hertfordshire. In fact, hardly any county in southern England is without its celebrated representative of the monarch of the woods. Formerly it was much more common; and even so lately as the days of Henry VII. no less than the one-third of England was covered by forests in which the oak predominated. The only foreign variety which appears to accommodate itself to our climate is the *q. cerris*, or Turkey oak, of which a very beautiful sub-variety was obtained from seed at Fulham.

Only one of the evergreen oaks, the *quercus ilex*, has been cultivated to any extent; for the *q. suber* and *q. esculus*, though they are grown with tolerable success in the south of England, are too delicate to support our more rigorous winters. The *quercus ilex* was introduced about the middle of the 16th century; and is only planted in ornamental gardens or parks.

The common beech, *fragus sylvatica*, a tree of the first magnitude, rivalling the oak, ash, or chestnut, is one of the four great indigenous trees of the island. It is supposed to have been originally confined to the chalk districts of the midland counties, or the dry calcareous regions, in which it often occupies extensive forests to the exclusion of other trees. In Windsor Park are to be found magnificent representatives of the class; but it is not common in the parks or pleasure grounds near London. Some tolerably fine specimens are to be seen in Kensington Gardens. The dimensions the beech attains on dry calcareous soils are 100 ft. high by 12 to 20 ft. circumference of the stem at about one foot from the ground.

By some botanists the *castanea vesca*, or sweet chestnut, is considered indigenous; the more general opinion, however, attributes its introduction to the Romans. In suitable soils near London, it grows more rapidly than the oak, for in from 50 to 60 years it attains a height of 60 to 80 ft.; but after that period the timber begins to get shaky at heart. The chestnut thrives for centuries, however, after the interior has entirely decayed, for many of the historical trees are entirely hollow. It requires warm and sheltered positions to attain its full development in our climate, with a soil of a loam of tolerable quality. Very fine samples are to be found in Cobham and Greenwich Parks, and in Kensington Gardens.

The common hornbeam, or *carpinus betulus*, is an indigenous tree of the second class, principally grown as an underwood. It abounds in Essex, Kent, and Norfolk, where it affects cold, stiff, clayey soils, and grows sometimes to 50 ft. in height, with a circumference of from 6 to 8 ft.

At Lee Court, Kent, and in some pleasure grounds near London, are some fine specimens of the *platanus orientalis;* and in good alluvial soil on the banks of the river, as at Fulham, the *platanus occidentalis* also is found. At Lambeth Palace, and in Chelsea Gardens, are remarkably fine specimens of the latter.

The common yew tree, or *taxus baccata*, is an indigenous tree, affecting rocky and mountainous districts, in soils of a stiff calcareous nature, kept moist by the percolation of water, or by shade. The yew is of very slow growth, but it attains great age; as, for instance, the Ankerwyke yew, in sight of the place where Magna Charta was signed, and where Henry VIII. made appointments with Anne Boleyn, is supposed to be 1000 years old. In Ifley churchyard is a yew tree with a hollow trunk, but a flourishing head, which is supposed to date prior to the Conquest. The species of superstitious affection with which the yew tree is regarded, is perhaps increased by its being the favourite resort of the missel thrush and the blackbird.

Of late years it has become fashionable to establish pinetums or collections of *abietinæ*. Amongst the most celebrated of these may be cited the pinetum of Dropmore, near Windsor, and Flitwick House, Bedfordshire, to which we are indebted for the naturalization of many foreign varieties of the pine tribe. Those most usually planted near London are the common pine, *pinus sylvestris*, an indigenous tree, rising to 80 or 100 ft., with a diameter of from 2 to 4 ft. in favourable situations; the Corsican variety in Kew Gardens is 90 ft. high. At White Knights, also, it thrives equally well. The *pinus pinaster*, or cluster pine, grows on sandy soils and upon the sea shore, in exposed positions. The *pinus strobus*, or Weymouth pine, has produced some fine trees, near Strathfieldsaye; as also has the *pinus cimbra* at Dropmore. In the pleasure grounds of Kent and Sussex, it has been long the custom to plant the *abies excelsa*, or Norway spruce, as an ornamental tree. At Strathfieldsaye and Sion House, are many fine hemlock spruces (*abies Canadiensis*), and at the latter are several specimens of the *abies nigra*, the lower branches of which have taken root where they touch the ground. The silver fir, *pinus picea*, has been planted as an ornamental tree since the commencement of the 17th century; but of all the pine tribe introduced of late years, without exception, the larch, *pinus larix*, is the most remarkable both for its beauty and its utility. It does not, however, grow well near London, but requires a mountainous situation. The *pinus cedrus*, cedar of Lebanon, has been planted as an ornamental tree for many years, for which purposes its grand, picturesque mass renders it peculiarly fitted. The largest specimens of the *pinus cedrus*, in the valley of the Thames, are at Strathfieldsaye, where one has attained a height of 108 feet; and at Syon House, where there is a tree measuring 72 feet in circumference, at three feet from the ground, and 117 feet is the diameter of the head.

At White Knights and Claremont, and at several places in Kent and Essex, the magnolia has been planted as a tree with great success. The varieties which have stood our climate the most perfectly are the *magnolia acuminata*, *m. cordata*, and *m. conspicua*. They require a little care in the early stages of their growth, but they thrive well near London.

The *enonymus Europæus*, or common spindle tree, is an indigenous tree of the second order in Scotland, where it attains from 25 to 30 feet in height. Near London, the finest specimens are in Kensington Gardens, where they do not exceed 15 feet.

The *cerasus Lusitanica*, or common Portuguese laurel, has attained at Syon, Charlton, Cobham, and Claremont, the dimensions of a tree of the second class, reaching 40 feet occasionally. It stands exposure to our ordinary winters; but it is often killed down to the ground by severe frosts. The common box-tree, or *buxus sempervirens*, is one of those about whose origin the greatest doubts exist. It is vulgarly supposed to be indigenous, and the early botanists gave as its *habitat*, Boxhill, Surrey. It is true that it attains there a development in a wild state, which seems to warrant the supposition that it is a native of our islands. But historical evidence is far from confirming the tradition which makes it to be so. On the dry chalky soil of Boxhill this tree attains 30 feet in height, but it is generally known as a shrub.

There are of course many other trees and shrubs cultivated for use and ornament near London, such as the lilac, the laburnum, the acacias, the bay, laurustinus, privet, arbutus, rhododendrons, &c. To enumerate all would lead us beyond the bounds of this notice; the reader is therefore referred for more ample details to the works enumerated at the end of this section. To such as are desirous of studying in person this interesting branch of botany, we recommend an examination of the woods near Cray, in Kent, Epping Forest, Greenwich Park, Kensington, Windsor, Claremont, Strathfieldsaye, White Knights—no longer in its glory—Fulham, Ken Wood, Syon House, Kew, and the woods near High Clere, and many other places in Buckinghamshire and Oxfordshire, and Cheshunt in Herefordshire.

The wild flowers, grasses, mosses, algæ, &c, are most favourably studied in such places as by prescription, or on account of the unproductive nature of the soil, have been left in a state of nature. We may cite Wimbledon, Putney, Wandsworth, and Streatham Commons; Norwood, Croydon, Mitcham, and Battersea Fields; the river side between Hammersmith and Kew, Esher, Thames Ditton, Woking Common, Bagshot Heath, Hampstead, Epping Forest, Blackheath, and Charlton, and the marsh districts. Every one of these localities possesses its characteristic Flora, and would amply repay a visit from the botanist. Cooper's Flora Metropolitana contains in detail the list of plants to be found at each place, arranged upon the natural system; Curtis's Flora Londinensis, and Smith and Sowerby's English Botany, contain the same information classified according to the Linnean system. Amongst the most interesting plants may be cited the *Veronica* tribe, which are very common about Hampstead and Charlton; the *iris pseudacorus* and *fœtidissima;* the *valerina officinalis*, growing wild near osier grounds; the *scabiosa;* the *sagina erecta*, at Blackheath; the *pulmonaria maritima;* the *lonicera periclymenum*, or woodbine; the *primulæ*, *acaillis*, *officinalis* and *farinosa*, or primroses; the *campanulæ*, or heath-bell flowers; the *fritillaria meleagris*, from Kew and Mortlake; the *convallaria majalis*, or lily of the valley, already mentioned as a native of Hampstead, Kenwood, and Dulwich; several varieties of the *rumex*, or dock; the *epilobium*, or willow herbs; the *erica*, *polygonium*, *saxifraga*, and *sedum;* the *saponaria officinalis*, from Combe Wood; many species of the *cerastium* and the *ranunculus digitalis*, *antirrhinum*, *malva*, *vicia ervium*, *medicago*, *hypericum*, *leontodon*, *carduus*, *chrysanthemum*, *centaurea*, *viola*, *orchis*, and *orphys;* the *arum maculatum*, or cuckoo's pint; besides an infinite variety, whose enumeration would swell our notice to an unlimited extent. The great number of the *gramineæ* is perhaps one of the characteristics of the alluvial plains by the river side. The *leguminosæ* prevail to a great extent on the gravelly soils of the more elevated heaths. Of these the *cytisus scoparius*, of Wimbledon and Putney, is renowned for the enthusiastic admiration it is reported to have excited in the celebrated Linnæus.

Of the *Algæ* the British Flora is supposed to possess about from 300 to 400 species of the marine, and so immense a number of freshwater species of algæ that we are induced to question the correctness of the classification. In the London Basin, of course, the marine algæ are few, being solely confined to the embouchure; and even there rarely passing into what may strictly be called the river itself. If we adopt the classification according to the colour of the series, we find that our British marine algæ consist of $\frac{1}{5}$ of the olive, $\frac{3}{8}$ of the red, and $\frac{1}{4}$ of the green series, with about $\frac{1}{5}$ of the diatomaceæ. Of the fresh water *algæ*, it appears that there are 20 families, consisting of about 170 genera, with nearly 1000 species according to the latest author upon this branch of botany, the greater number of which are to be found near Cheshunt, and in the valleys of the Thames and the Lea.

The Fauna.—If the Flora of England has been modified by the progress of civilization, the other regions of the organized kingdom bear equal marks of its effects. Thus, amongst the animals formerly found in our country, we find that the Irish elk has disappeared since our island was inhabited by the human race, though before any historical records were kept, the beaver hardly seems to have existed during the civilized era. The Scottish bear Martial alludes to (the *ursus arctos*) is not mentioned subsequently to 1072; the wolf was extirpated from Scotland about 1577, and from Ireland in 1710; it had long before ceased to infest England. The wild boar, the wild bull, and wild cat used, in the time of Fitz Stephen, to haunt the forests of Highgate and Hampstead; all have been swept away by the advancing stream, with the exception of a few wild cats left in the North of England.

The list of British quadrupeds, then, is very limited; as they are all found in the valley of the Thames it is inserted *in extenso*.

Cheiropteræ, Bats .	12	species of the family	*Vespertilionidæ.*
	2	,, ,, ,,	*Plecotus.*
	1	,, ,, ,,	*Barbastellus.*
	2	,, ,, ,,	*Rhinolphus.*
Eranaceus, Hedgehog	1	,,	*Eranaceus Europæus.*
Talpa, Mole . .	1	,,	*Talpa vulgaris.*

Soricidæ, Shrews	3 species.	*Sorex arenareus*, Shrew Mouse.	
		,, *fodiens*, Water Shrew. Essex.	
		,, *remifer*, Oared Shrew. Norfolk.	
Ursidæ, Bear	1 ,,	*Melestaxus*, the Badger.	
Mustelidæ, Weasel	5 ,,	*Lutra vulgaris*, Otter.	
		Muztela vulgaris, Weasel.	
		,, *erminea*, Stoat.	
		,, *putorius*, Polecat.	
		,, *furo*, Ferret.	
		Martes foina, Beech Martin.	
		,, *abietum*, Pine Martin.	
Felidæ, Cat	1 ,,	*Felis catus*, Wild Cat.	
Canidæ, Dog	2 ,,	*Canis familiaris*, Dog.	
		Vulpes vulgaris, Fox.	
Phocidæ, Seals	5 ,,	*Phoca vitulina*,	Sea Calf, rare in the southern parts of the British islands.
		,, *Grænlandica*,	
		,, *barbata*,	
		Halichærus gryphus,	
		Trichecus Rosmarus, Walrus, very rare.	
Sciuridæ, Squirrel	2 ,,	*Sciurus vulgaris*, Squirrel.	
		Myoxus avellanarius, Dormouse.	
Muridæ, Mice	5 ,,	*Mus messorius*, Harvest Mouse.	
		,, *sylvaticus*, Long-tailed Wood Mouse.	
		,, *musculus*, Common Mouse.	
		,, *rattus*, Black Rat.	
		,, *decumans*, Norway Rat.	
Castoridæ, Beaver	3 ,,	*Arvicola amphibus*, Water Rat.	
		,, *agrestis*, Field Mouse.	
		,, *pratensis*, Bank Vole.	
Leporidæ, Hare	4 ,,	*Lepus timidus*, Hare.	
		,, *variabilis*, Alpine Hare.	
		,, *cuniculus*, Rabbit.	
		Cavia aperea, Guinea Pig.	
Pachydermata	3 families.	*Sus scrofa*, Common Boar.	
		Equus caballus, Horse.	
		Asinus vulgaris, Ass.	
Cervidæ, Stags	3 species.	*Cervus elephas*, Red Deer. New Forest.	
		,, *dama*, Fallow Deer.	
		,, *capreolus*, Roe Buck.	
Bovidæ, Bulls	2 ,, ?	*Bos taurus*, with varieties.	
		Urus Scotticus, Chillingham Cattle.	
Capridæ, Goats	2 ,,	*Capra hircus*, Common Goat.	
		Oris aries, Common Sheep.	
Cetaceæ, Whales		These mammalia are sometimes stranded in the Thames.	
Delphinidæ		*Delphinus delphis*, Common Dolphin.	
		,, *tursio*, Bottle-nosed Dolphin.	
		Phocæna communis, Porpoise.	
		,, *Orca*, Grampus.	
		,, *mela*, Round-headed Porpoise.	
		Beluga lucus, White Whale.	
		Hyperoodon Butzkopf, Bottle-headed Whale.	
		Diodon Sowerbii, Sowerby's Whale.	
		Monodon Monoceros, Norwhal.	
		Physeter macrocephalus, Cachalot.	
		,, *torsio*, High-finned Cachalot.	
		Balæna mysticetus, Common Whale.	

Amongst the reptiles we only find, in our islands, of the—

Testudinata	1 species.	*Chelonia imbricata,* Hawk's-bill Turtle.
Lacertidæ	2 ,,	*Lacerta agilis,* Sand Lizard.
		Zootica vivipara, Viviparous Lizard.
Anguidæ	1 ,,	*Anguis fragilis,* Blindworm.
Colubridæ	2 ,,	*Natrix torquata,* Ringed Snake.
		Pelius Berus, Viper, or Adder.
Ranidæ	2 ,,	*Rana temporaria,* Common Frog.
		,, *esculenta,* Edible Frog.
Bufonidæ	2 ,,	*Bufo vulgaris,* Common Toad.
		,, *calamata,* Natterjack.
Salamandridæ	4 ,,	*Triton cristatus,* Newt.
		,, *Bibronii,* Straight-lipped Newt.
		Lissotriton punctatus, Eft.
		,, *palmatus,* Palmated Eft.

Crustacea.—Without entering into details upon the crustaceæ of our shores, we will content ourselves by remarking, that in the valley of the Thames, both in the salt and fresh water divisions, the greatest number of that class of animals belong to the order *Decapoda.* Thus we have the lobster, the prawn, shrimp, crayfish, of the section *Macroura;* and the common crab of the section *Brachyura.* The reader who desires more detailed information upon this subject is referred to Bell's "British Crustacea," or Dr. Fleming's works.

Mollusca.—The conchology of the basin of the Thames is not very clearly defined, in the portion of its estuary, owing to the violence of the tides and currents which prevail there. Specimens of many genera and species foreign to our islands are therefore often met with, but there is a necessary degree of uncertainty attached to any classification of them as connected with our country under these circumstances, which induces us to hesitate before including any definite list. We content ourselves, then, by observing that it is common to find on the shores of the Kentish and Essex coasts of the Thames, bivalve shells of the *ostrea*, *avicula*, *orbicula*, *crania*, *terebratula*, *haliotis*, *pecten*, *arca*, *mactra*, *pholas*, *cardium*, *teredo*, *solen*, *cytherea*, *mytillus*, *modiola*, *mya* and *anatina.* Of the univalves, we find the *patella*, *chiton*, *murex*, *echini*, *cowry*, *mitra*, *voluta*, *oliva*, *ovulæ*, *cypræa*, *bulla*, *pleurotoma*, *&c.*

The land and fresh water mollusca present, necessarily, greater fixity of character, and are found in considerable numbers. The bivalves consist of seven species of the *cyclas*, principally in the upper parts of the Thames, the *anodon cygneus*, of large dimensions, on Hampstead Heath, and two species of *mysca.* The univalves comprise the *limacellus*, *testacellus*, *vitrina;* 18 species of *helix*, *carocolla*, *clausilla* (5 species), *bulimus* (4 species), *balæa*, *achatina*, *succinea*, *cyclostoma*, *carychium*, *pupa*, *vertigo;* 10 species of *planorbis*, *segmentina;* 9 species of *limneus*, *physa*, *valvata;* 3 species of *paludina*, *heretina*, *ancyllus.* There are in all 85 species belonging to 26 genera of this division of the testacea.

Fishes.—The fishes which inhabit the Thames and its affluents have not escaped the influence of the progress of civilization, and of the errors committed in the disposal of the refuse of our overgrown metropolis. In former times salmon, shad, and the lamprey were frequently caught in the river, but they have long ceased to inhabit it, unless occasionally. The fish to be caught at the present day may be briefly enumerated as follows,—bearing in mind that those above-mentioned are only occasional visitors, as is also the sturgeon, that even eels are becoming rare in the districts affected by the sewerage, and that the only members of this division which seem to thrive in the present filthy state of the Thames are the white bait. We find the salmon, sturgeon, tench, barbel, roach, dace, chub, bream, ruffle, gudgeon, perch, eels, smelts, flounders, lamprey, shad, pike, trout, white bait, and the crusian and sticklebacks, the minnow, carp, gold fish, &c., in the upper parts of the river. The estuary is sometimes visited by the blue shark, sea-fox, dog-fish, conger-eel, cod-fish, haddock, whiting, hake, ling, doree, halibut, plaise, soles, turbot, mackarel, bass, mullet, sprat, anchovy, but the presence of these fish is becoming more and more rare. Of those which appear to affect certain localities, we may cite the flounders and white bait of the Thames (*flessus* and *cephalus alburnus*), the trout (*salmo fario*) of the Wandle and the Wey; the grayling (*salmo thymallus*) of the Thame near Ludlow; and the rud (*cyprinus finscale*) of the Cherwell; the pike (*esox lucius*) is also common in the side streams.

Infusoria.—The animalculæ in the Thames water only begin to appear in a sensible proportion, according to the researches of Dr. Angus Smith, at Windsor, where it contains many rather large *hydatinæ*. At Oxford, it is true, we find some of the smaller green *naviculæ*, and several other smaller green *bacillaria;* but the river appears to purify itself in its course, for at Reading these animalculæ do not appear in such numbers. From Richmond downwards, the case is much altered; at such places as Chelsea, Hungerford Market, &c., the deposit from the water contains many animals, large and gelatinous looking; the *vibrio fluviatilis*, about $\frac{1}{30}$ of an inch long, is very common, as are also many polygastric animalculæ, chiefly of the *navicula fulva*, which appear to thrive upon the abundance of silica brought down by the sewers and house drainage. The season of the year must doubtless affect the relative numbers of these animalculæ, for we find that the Thames water is much harder at certain periods than at others.

Birds.—Improved cultivation has affected the habits of the feathered tribes which frequent our shores. From their organization these are free to migrate according to the adaptation of any particular country to the supply of their wants. As the primæval forests have been cleared, the heaths cultivated, and marshes and lowlands drained, the birds they were wont to nourish have been forced to seek elsewhere the conditions most favourable for their subsistence

The species of the *falconidæ*, for instance, which frequented the valley of the Thames, are far from being as numerous at the present day as they were formerly; the *tetraonidæ* are more rare, some even (such as the Great Bustard, *otis tarda,*) have entirely abandoned us; the *gruidæ* are now met with less frequently, although some of them still remain; the *ardeidæ* have left many of their ancient habitats; the *natatores*, although they still visit our shores, are not to be found in many places they used formerly to visit in great numbers.

Amongst the birds admitted into the catalogues of the visitors or natives of our isles, there are perhaps as many as 237 species; but as the list comprehends many which are evidently nothing more than stray wanderers, we may perhaps consider that number to be somewhat exaggerated. Some of the most remarkable of those found in the district in the immediate proximity of the valley of the Thames are the following:—

Falconidæ.—The *aquila chrysætos,* or golden eagle, is sometimes found near Bexhill, and south of London; but very rarely. The *haliætus albicilla,* or white-tailed eagle, is occasionally met with in Epping and the New Forests. The *pandion haliætus,* or osprey, is found in Sussex, and near Selborne in Hampshire. The species of *falco* indigenous to our islands are the *peregrinus* (or peregrine), *æsalon* (the merlin), *tumimculus* (kestrel); the visitors in the south are the *falco subbeto* (hobby) and *rufisses* (red-footed). The *accipiter nisus* (sparrow-hawk), *milvus vulgaris* (kite), *buteo vulgaris* (common kite), *circus æruginosus* (marsh-harrier), and *circus cyaneus* (hen-harrier), are common in Kent, Hertfordshire, Essex, Hampshire, Cambridgeshire, &c. The *astur palumbarius* (goshawk), *nauclerus furcatus* (swallow-tailed kite), *buteo lagopus* (rough-legged buzzard), *pernis apivorous* (honey buzzard), are more rare in that district.

Strigidæ.—The *bubo maximus, scops aldrovandi* (scop-eared owl), *otus vulgaris* and *otus brachyotis* (long and short-eared owls), the *surnia myctea* and *funerea,* and the *noctua tenginalini,* are visitors near London at intervals. The *strix flammea* (barn owl), *syrnium stridula* (tawny owl), and the *noctua passerina* (little owl) are rather common.

Laniadæ.—The visitors are the *lanius excubitor* (great gray shrike), *l. collurio, l. rutilus,* which are rather common.

Nuscicapidæ.—These are summer visitors. Amongst them we may mention the *muscicapa grisola,* and *atricapilla,* the spotted and pied fly-catchers; the latter rare.

Merulidæ.—This well-known family is common in the southern parts of England. The species met with are *cinelus aquaticus* (common dipper), *turdus viscivorus* (missel thrush), *t. pilaris* (fieldfare), *t. musicus* (song thrush), *t. merula* (blackbird), *petrocinela saxatilis,* or rock thrush. More rarely we find the *turdus Whitei, t. iliacus* (or redwing), *t. torquatus* (ring ouzel), and the *oriolus galbula* (golden oriole), found near London.

Sylviadæ.—The residents or common visitors are the *accentor modularis* (hedge accentor); *erythaca rubecula* (redbreast); *phœnicura suecica* (blue-throated warbler); *p. ruticilla* and *tithyx* (redstart); *saxicola rubicola* (stonechat); *s. rubetra, œnanthe;* and *locustella* (species of chats); *salicaria phragnitis* (sedge warbler): *philomela luscinia* (nightingale); *curruca atricapilla* (blackcap warbler), *c. hortensis, c. cinerea, c. sylviella; sylvia sylvicola* (wood warbler), *s. trochillus, hippolaris; regulus cristatus* (golden-crested warbler), *r. modestus.* Occasionally may be seen the *accentor alpinus; salicaria luscinoides; salicaria arundinacea,* most common in Romney Marsh and on the banks of the Thames; the *melizophilus Dartfordiensis* is common near Bexley Heath; the *regulus ignicapillus* is rare.

Paridæ.—These birds seem to prefer the neighbourhood of London, for we find near it the *parus major,* or great tit; *p. cærulus; ater cristatus, palustris* and *caudatus ;* the *parus cristatus* being the most rare. The *calamiphilus biarmicus* (bearded tit) is found in Barking Creek occasionally.

Ampellidæ.—The *bombycilla garrula,* or Bohemian wax wing, is but a rare visitor in this country.

Motacilladæ.—The constant visitors of this family are the *motacilla Yarrellii* (pied wagtail) ; *m. boarula ; m. flava ;* the more rare visitors are the *motacilla alba* and *m. neglecta.*

Anthidæ.—The *anthus arboreus* (tree pitpit) is a common summer visitor near London ; *a. pratensis* is nearly a resident; *a. ricardi* is rare.

Alaudidæ.—The rarest of the lark tribe are the *alauda alpestris* (shore lark); *a. cristata,* and *a. brachydactyla.* The *alauda arvensis* (skylark) is more common, and is met with in great numbers in the corn lands near London; the *a. arborea* (woodlark) is also common.

Emberizidæ.—It is not often that the *plectrophanes Lapponica* (or Lapland bunting), the *p. nivalis* (snow bunting), or the *emberiza schœniculus* (black-headed bunting), visit the southern parts of England. It is more common to find *plectrophanes milaria* (common bunting), *emberiza citrinella* (yellow hammer), and *e. hortulana* (ortolan bunting), near London.

Fringillidæ.—This numerous family in the vicinity of the metropolis comprehends most commonly the *fringilla cœlebs* and *montifringilla* (the chaffinch and bramble-finch) ; the *passer montanus* and *domesticus* (the tree and house sparrow) ; *coccothraustus chloris* (greenfinch), *c. vulgaris* (hawfinch) ; found in great numbers in Epping Forest ; *carduelis elegans* (goldfinch) ; *linota cannabina* (common linnet). *l. linaria* and *l. montium,* with *pyrrhuta vulgaris* (bullfinch). The more uncommon members in this country are—*carduelis spinus* (siskin), and *linota canescens ; pyrrhula mucleator* (pine grosbeak) is a very rare visitor; *loxia curvirostra* (common crossbill) is found in Sussex and Essex ; *l. pityopittacus* and *leucoptera* are extremely rare.

Sturnidæ.—The *sturnus vulgaris* (common starling) is the member of this family most frequently met with. The *agelaius phœnicus* and *pastor roseus* are only occasional visitors.

Corvidæ.—These comprise, near London, the *fregillus graculus* (chough) ; *corvus corax* (raven), *c. corone, cornix, frugilegus* (rook) ; *monedula* (jackdaw) ; *pica caudata* (magpie) ; *garrulus glandarius* (jay) ; and the *nucifraga caryotactes* (nutcracker).

Ricidæ.—Picus martius (black woodpecker) is rare ; *picus viridis* is more common ; *p. major* and *p. minor* are also frequently to be found near London.

Certhiadæ.—Yunx torquilla (wryneck) is common in the south-east of England; *certhia familiaris* (common creeper) ; and *troglodytes vulgaris* (or wren) are also frequent. The beautiful *upupa epop* has been frequently caught at Fulham, and the *Sitta Europæa* (or nuthatch) in Kensington Gardens.

Cuculonidæ.—Cuculus canorus is a well-known spring visitor ; the *coccyzus Americanus,* or yellow-billed cuckoo, is very rare.

Meropidæ.—The *Alcida hispida* (king-fisher) is the most common bird of this tribe; occasionally we are visited by *coracias garrula* (roller), and *merops apiaster* (bee-eater).

Hirundinæ.—These visitors consist of the *hirundo rustica* (swallow), *h. urbica* (martin), *h. riparia* (bank martin), *h. apus* (swift), *clypselus* (white-bellied swift).

Caprimulgidæ.—The *caprimulgus Europæus* is the only member of this tribe which visits us constantly.

Columbidæ.—In the woods near London we find in considerable numbers the *columba palumbus* (cushat) ; the *c. œnas* (stock-dove) ; *c. livia* (rock-dove) ; *c. turtur* (turtle). The latter is most common in Kent and Hertfordshire. Occasionally the North American Passenger Pigeon (*columba migratoria*) has been found in this neighbourhood.

Phasianidæ.—We only find wild near London the *phasianus colchicus* (common pheasant).

Tetraonidæ.—This tribe is more numerous in Scotland than it is in the south, for it is only at rare intervals that the greater number of its species are found with us. The British birds are *tetrao urogallus* (capercaille), *t. tetrix* (black grouse), *t. Scoticus* (red grouse), *t. lagopus* (ptarmigan), which rarely are seen near London. *Perdix cinerea, p. rufa* (common red-legged partridge), and *perdix coturnix* (quail), are common. As was said before the *otis tard*, formerly common in Suffolk and Norfolk, has nearly abandoned our shores; whilst *otis tetrax* (the small bustard) is also rare.

Charadridæ.—The birds of this family found in the south-east of England are the *cursorius Europæus* (cream-coloured courser); *otis œdicnemus* (great plover); *charadrius pluvialis* (golden plover), *ch. mormellus, c. hiaticula, c. cantiana, c. minos. Tringa squatarola* (gray plover), *t. vanellus* (lapwing), *t. interpres* (turnstones). *Hœmatopus ostralegus* (sea pie), and *charadrius calidris* (sanderling plover), are found on the shores of the estuary of the Thames and the sea-coasts.

Grinidæ.—We have before observed that these were more rare in former times than at the present day; for the *ardea grus* (common crane) was a frequent visitor, though now rare. The *ardea cinerea* (heron) is still common in Lincolnshire; *a. caspica, a. alba, a. garzetta, a. æquinoctialis, a. comata,* are met in sufficient numbers in the fen districts to warrant their being classed as British birds. *Ardea minuta* (little bittern), *a. stellaris* (common bittern), are more frequently met with. The *ardea lentiginosa, a. nycticorax, a. ciconia* (white stork), *a. nigra, plateala leucorodia* (white spoonbill), and *tantalus falcinellus* (glossy ibis), are more rare. The birds of this tribe are by some ornithologists separated from *ardea grus* and its congeners under the name of the *Ardeidæ.*

Scolopacidæ.—Of this family we have the *numenius arquatar* (common curlew), *n. phœopus; scolopax totanus,* and *s. caladrix* (red shanks); *tringa ochropus, t. glareola, t. hypolencos, t. macularia* (sand pipers), *tringa glottis* (green shank); *recurvirostra avosetta* (avoset formerly common in Romney Marsh, but now rare); *charardius humantopus; scolopax Lapponica* and *œgocephala; tringa pugnax* (ruff), *t. rustica* (woodcock), *t. major* (snipe), *t. galinula, t. islandica, t. pusilla, t. alpina, t. pucilla, t. maritima* (sand piper), and *numenius pygmeus* (curlew sand piper).

Rallidæ.—This family is represented by the *Gallinula crex* (land rail), *g. porsana, g. minuta; rallus aquaticus* (water rail), *gallinula chloropus* (moor hen), and *fulica atra* (common coot).

Analidæ.—This member of the division of the *natatores* is represented by numerous species at the present day, although from the causes alluded to more effectually acting upon their means of subsistence, namely, the reclaiming of marsh lands, they are more rare than formerly. Amongst the most remarkable varieties are the *anas anser, a. segetina, a. phœnicopus, a. albifrons, a. erythropus, a. vernicla, a. ruficollis, a. Ægyptiaca, a. Gambensis, a. Canadensis,* of what are vulgarly called the geese. *Anas cygnus* (wild swan), *anas olor* (mute swan of the Thames), and *a. immutabilis* (Polish swan), represent that division. *Anas clypeata, a. strepera, a. acuta, a. glocitans, a. boschas, a. crecca, a. Penelope, a. Americana, a. mollissima, a. spectabilis, a. fusca, a. nigra, a. perspicillata, a. ferina, a. ferrugina, a. marila, a. fulgilla, a. clangula; fuligula rufina* and *f. dispar; mergus albellus, m. serrator, m. merganser, &c.*; represent the tribes of wild ducks, teals, eider ducks, widgeons, scoter, smews, &c., which continue to visit us.

Colymbidæ.—Of this division we possess the following varieties. *Podiceps cristatus, p. rubicollis, p. cornutus, pauritus, p. minor; colymbus glacialis, c. arcticus, c. septentrionalis.*

Alcadæ.—The sea-shore frequenting birds of this division are the *uria troile, u. brunnichii, u. grylle; alea alle, a. arctica, a. torda.*

Pellicanidæ.—These are rare visitors; nor do we find any but the *Pelicanus carbo, p. bassanus;* the *p. cristatus* (shag) is common on our shores.

Laridæ.—Of the Terns of this family, we find most commonly the *sterna hirundo* and *s. fissipes,* the latter principally in Cambridgeshire; more rarely we meet with *s. caspia, s. baysii, s. anglica, s. minuta.* Of the *laridæ*, or gulls, we have *larus minutus, l. tridactylus, l. comus* (common gull), *l. marinus, l. cataractes* (common skua of Suffolk and Norfolk): *l. cataractes pomarinus glacialis,* and *procellaria pelagica* (storm petrel), sometimes are seen in the Thames.

In England we are comparatively free from insect plagues. Occasionally a gardener suffers no little wrath and vexation from the unceremonious and effective way in which whole rows of cabbages, &c., are entirely consumed by the larvæ of the common white butterfly, and our fruit trees are often despoiled both of beauty and crop by the attacks of many of the smaller species; but still, with a few exceptions, insects here rarely cause more than damage to individuals. On one very celebrated occasion, however, in the year 1825, a very fine row of elm trees, in Camberwell Grove, were suddenly found to be blighted, and many of them utterly destroyed. As no cause was apparent for this, many of course were conjectured; the air and smoke of London were pretty generally believed to be unfavourable to elms, and the inhabitants of the vicinity actually brought an action in Chancery against the proprietors of some neighbouring gas works, as the originators of the evil; whereas, a more minute examination of the trees themselves traced the whole damage to the ravages of a small beetle (*scolytus destructor*), which, by boring its holes and innumerable passages under the bark, had quite destroyed the trees. This insect is well known abroad; France and Brussels have severely suffered from its ravages. The above-mentioned incident caused a great sensation at the time, and entomology for some years was a rather fashionable study.

The turnip-fly, too (*haltica nemorum*), will frequently destroy whole fields of young turnips, and, for the first few days after the seedling leaves have appeared, these small animals occupy a large share of the agriculturist's mind; but as soon as the rougher leaves of the plant are thrown out the danger from this cause ceases. This beetle may always be found in some abundance in nearly every rough hedge-row or waste, where they shelter themselves all the winter, only leaving them for the more tempting turnip seedling. It would be as well perhaps, therefore, if the farmer would add this argument to the many others for diminishing the enormous hedgerows we so frequently see.

The hop fly (*aphis humuli*) is by far the most important of these little pests; it is a small fly, which appears devoted exclusively to this plant, and by its abundance or scarcity affects not only the crops and pockets of separate cultivators, but does so to such an extent as to be felt by the British Exchequer to the amount of some £100,000 to £150,000 per annum. The common lady-bird, in its larva state, devours immense quantities of these insects, hence they should be tended with the greatest care; yet, on one occasion, when these little red insects appeared in great numbers in the hop grounds of Kent, the growers, regarding them with great horror as an aggravation of the evil they were sent to cure, actually collected them by bushels and destroyed them.

But, still we must congratulate ourselves on our exemption from great evils, as with the above exceptions, cleanliness of person, or of house, will generally guard us sufficiently against the principal other entomological torments to which Britons are liable.

Owing to our moderate climate we have very few insects of large size, yet the dampness and length of twilight render our fauna somewhat peculiar and interesting. The great comparative abundance of the moth tribe may be attributed to this, as we have about 1700 species of this night and twilight class, to only 100 species of butterflies, or day-flying *lepidoptera.* The number of species found in Great Britain, by Stephen's Catalogue, is as follows :—

Coleoptera	about	3300	species.
Lepidoptera	„	1838	„
Hymenoptera	„	2054	„
Diptera	„	1671	„
Hemoptera	„	605	„
Other insects	„	544	„

making in all about 10,000 species. Of these, a very large proportion may be found in the neighbourhood of London. The woods near Dartford, and the crags in Kent, may be searched with profit by the collector; he will here find the large and rare moth the Kentish glory, *endromis versicolor*, which is seldom found elsewhere; the *nolodonto zigzac*, a moth so named from the extraordinary shape of its larva, *stamopus fagi ;* several local butterflies, such as the chalk hill blue, the dark brown and duke of Burgundy frittillaries, the scarlet and wood tiger moths, and several beautiful beetles.

As near as Greenwich Park, in the summer months, the great stag beetle (*lucanus cerous*) may frequently be found in abundance, though it is rare in England save in Kent.

The osier grounds near the Thames will supply some rare insects, the *lesias*, and *trochilium*, moths of some scarcity; while in Essex and Hertfordshire may be found the purple emperor butterfly, the brown frittillary, and white admiral butterflies, the death's-head and parrot-hawk moths, and many other interesting species; while if we go towards Cambridge, which is now but a few hours from London, we come to an entirely different fauna; here we find the beautiful *papilio machaon*, a swallow-tail butterfly, still keeping up an unavailing struggle with the progress of agriculture; the splendid large copper butterflies and beetles of great beauty, the *cerambyx*, *septura*, *charcharias*, &c. But all this abundance of knowledge of species is owing, perhaps, as much to the greater care that has been bestowed on the study near the resorts of civilization than to any other cause, for there is no locality where a plant grows in which the devotee of the sister study, entomology, will not meet with objects both of pleasure and instruction.

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SECTION 5. STATISTICS.—As London is not confined by natural bounds nor by walls, has no octroi, and no general municipal organization, its statistics are far from complete, and in many cases it is impossible to give any definite information.

Boundaries and Extent.—This basis of calculation cannot be defined, as every day some new street takes the place of the green field, and it is therefore only possible to adopt a general idea of the giant city.

It has its heart in the county of the city of London, and is chiefly in Middlesex; on the east it spreads into Essex, on the south into Surrey, and on the south-east into Kent. It is crossed by the Thames from Hammersmith to Woolwich, passing under eleven great bridges, and winding in a length of about twenty miles, but not always with houses on its shores. On the north bank there flow the navigable Roding and Lea, the Fleet, and many small brooks and creeks; and the metropolis nearly touches the mouth of the navigable Brent, as in the north it does the sources. On the south bank the Ravensbourne and the Wandle flow within its bounds. On these many streams, some of which are now buried under houses or in sewers, the fleets of the Northmen once sailed, and battles were fought, and in later times mills were worked.

On the north of the Thames London crosses the range of hills and reaches Edmonton and Finchley; on the west it reaches Acton, Hammersmith, and nearly joins on to Brentford and Kew; on the east it reaches Layton and Ham. On the south of the Thames London embraces Wandsworth, Streatham, Dulwich, Lewisham, Woolwich, and Plumstead. To each of these points continuous streets of houses reach; but the solid mass of London lies within narrower bounds, with these several long arms extending from it. The greatest length of street, from east to west, is about 14 miles, and from north to south about 13 miles. The solid mass is about 7 miles by 4 miles, so that the ground covered with houses is not less than 20 square miles.

London has now swallowed up many cities, towns, villages, and separate jurisdictions. The four commonwealths or kingdoms of the Middle Saxons, East Saxons, the South-Rick, and of the Kentwaras, once ruled over its surface. It now embraces the county and episcopal city of London, the episcopal city of Westminster, the boroughs of Southwark and Greenwich, the towns of Woolwich, Deptford, and Wandsworth, the watering places of Hampstead, Highgate, Islington, Acton, Kilburn, the fishing town of Barking, the once secluded and ancient villages of Ham, Hornsey, Sydenham, Lee, Kensington, Fulham, Lambeth, Clapham, Paddington, Hackney, Chelsea, Stoke Newington, Newington Butts, Plumstead, and many others, the jurisdiction and lieutenancy of the Tower and Tower Hamlets, and of the Hospital of St. Katharine's, and the lordship of the Duchy of Lancaster in Westminster.

Population.—In 1841 the population of the metropolis was taken as 1,998,455, and it is now about 2,250,000, being the city of the greatest ascertained population and greatest number of houses in the world. The return of 1841 is thus made up:—

London City, within the Roman walls		54,626
,, ,, without the Roman walls		70,382
Finsbury Borough		265,043
Tower Hamlets Borough and Liberty		419,730
Essex Division		23,954
Marylebone Borough		287,465
Marylebone Parish	138,164	
St. Pancras ,,	128,479	
Paddington ,,	25,173	
Westminster City		222,053
Kensington Division		109,625
Lambeth Borough		197,412
Greenwich and Woolwich Borough		72,748
Total		1,998,455

Recapitulation.—London in Middlesex	1,475,289
„ „ Essex	400,309
„ „ Surrey	98,903
„ „ Kent	23,954

The number of males capable of bearing arms in the metropolis is about half a million.

For the purposes of the registration of births, deaths, and marriages, London is reckoned as one of the eleven great divisions of England, and the population at successive periods is thus taken to enable comparison to be made:—

1801	958,863
1811	1,138,815
1821	1,378,947
1831	1,654,994
1841	1,948,369

In 1841 the number of males was 912,001, and of females, 1,036,368.

The births, deaths, and marriages in the metropolitan district stand thus:—

	Births.	Deaths.	Marriages.
1838	—	53,546	—
1839	53,575	46,100	18,384
1840	56,751	47,156	18,530
1841	58,362	46,292	18,246
1842	61,381	46,242	17,826
1843	62,134	49,477	18,669
1844	64,329	51,109	20,126
1845	65,884	48,318	21,770
1846	69,882	49,450	22,272

The number of births and deaths do not include the still-born.

The number of deaths occurring daily is 125.

Houses.—The number of houses in the registration district in 1841 was 278,093, whereof inhabited, 262,737, uninhabited, 11,324, building, 4032. The number of houses now is above 300,000, and the number of streets, alleys, &c., above 10,000.

Employment.—An analysis of the employment of the population, from the "Post Office London Directory" and the "Useful Knowledge Geography of England and Wales," gives the number of persons employed in the chief trades of London as follows:—

Millinery	40,282	Machinery	5,615
Clothes and Slops	28,848	Plate and Jewellery	5,561
Boots and Shoes	28,574	Coachbuilding	4,434
Books, Prints, &c.	14,563	Watch and Clockmaking	4,290
Silk weaving	14,563	Coopering	4,002
Cabinet making, &c.	12,419	Leatherworking	3,932
Shipbuilding	6,305	Brassworking	3,591
Painting and Sculpture	5,787	Hatmaking	3,506

Of most of these trades London is a chief seat. Other considerable trades are, Saddlery, 2626; Cartmaking, 2635; Carving and Gilding, 2181; Brush and Broommaking, 2155; Pianos, Organs, and other instruments, 1886; Tinplate working, 1419; Toys, 1298; Brewing, 1274; Rope, 1262; Fur, 1236; Glass, 1230; Iron, 1176; Wax and Tallow, 1130; Guns and Pistols, 1113; Mathematical Instruments, 1076; Artificial Flowers, 1025; Stained Paper, 966; Cutlery, 905; Baskets, 881; Bricks and Tiles, 840; Umbrellas, 831; Sailmaking, 713; Sugar refining, 645; Paper, 625; Chemicals, Dyes, Varnishes, &c., 617; Cork cutting, 576; Chair-making, 1700; Combs, 464; Goldbeating, 378; Hair working, 367; Ivory, 311; Type founding, 452.

Other employments are,—

PROVISION TRADES, 52,761.

Bakers	9,110
Butchers	6,450
Fishmongers	1,866
Grocers	4,986
Buttermen	1,732
Publicans	6,061
Milkmen	2,764

CLOTHING AND LEATHER TRADES, 126,508.

Tailors	23,517
Shoemakers	28,574
Drapers	3,913
Dressmakers and Seamstresses	27,049
Bonnetmakers	3,282

SPINNING, BRAIDING, PLAITING, AND WEAVING TRADES, 27,960.

BUILDING AND FURNISHING TRADES, 85,292.

Carpenters, &c.	18,321
Bricklayers	6,743
Painters, Plumbers	11,507
Masons	3,471
Sawyers	2,978

METAL TRADES, 33,308.

Smiths	7,481

CARRYING AND SHIPPING TRADES, 52,660.

PROFESSIONAL PERSONS, 28,318.

Schoolmasters and Teachers	9,244
Ecclesiastics	1,271
Medical Men	4,972
Lawyers	2,399
Engineers and Architects	1,379
Artists	4,431
Accountants	1,108
Public Servants, Policemen, and Soldiers	19,240
Merchants, Pawnbrokers, and Auctioneers	8,389
Clerks	20,932
Labourers	50,279
Omnibus and Cab Drivers	10,000
Male Servants	39,300
Female Servants and Nurses	138,917

The number of Irish in London in 1841 was about 70,000 (this is besides Irish born in London); of Scotch and Highlanders, 25,000; and of foreigners, 20,000. The rest of the metropolitan population is English, of whom about 1,200,000 at least are born in London.

Police.—The whole body of police is about 6000. The number of persons taken into custody yearly is 60,000 (males 40,000, females 20,000), of whom half for drunkenness, 10,000 for assaults, 15,000 for stealing, and 3000 for wilful damage. 5000 are yearly sent for trial to the superior criminal courts. Of those taken into custody 20,000 can neither read nor write; 35,000 read, or read and write imperfectly; 4500 read and write well; and 500 have superior instruction. Of those convicted by the superior courts only about 240 can read and write well, and 17 have superior instruction. The number of persons and children yearly reported to the police as lost is about 2500, of whom above 1000 are reported found by the police. The number of suicides committed is 160, and attempted 110, being less than the number in the smaller population of Paris. The number of fires is nearly 500. The cost of the police is about 400,000*l.* yearly; and this is besides prisons and judicial establishments.

Trade of London.—Tons of shipping yearly engaged in trade with the port of London:—

Coasting trade		3,000,000
Newcastle	1,300,000	
Sunderland	1,000,000	
Stockton	700,000	
English colonies		650,000
East Indies		200,000
English North America		200,000
West Indies		150,000
Russia		150,000
Holland		120,000
United States		100,000
Ireland		100,000
Sweden and Norway		100,000
France		90,000
Prussia		70,000
English Africa		60,000
Guernsey, &c.		50,000
Denmark		40,000
Flanders		40,000
Portugal		35,000
China		30,000

Education.—London is the seat of a university, and has five colleges, faculties, and superior schools for old classic and modern languages; 1 for women, 2 for East Indian studies, 2 for Hebrew (besides 3 chairs), 11 for medicine, 1 for the veterinary art, 1 for pharmacy, 17 for chemistry, 3 for geology and metallurgy, 4 for law, 3 for civil engineering, 5 for military engineering, 1 for music, 2 for the fine arts, 6 for teaching schoolmasters, 5 for teaching schoolmistresses, 2 for Episcopalian theology, 1 for Baptist ditto, 1 for Independent ditto, 1 for Unitarian ditto, 1 for Jewish ditto.

There are special schools for design, singing, church music, navigation, botany, horticulture, the blind, deaf and dumb, and idiots.

The University of London consists of a chancellor, vice-chancellor, and senate, appointed provisionally by the secretary of state for the Home Department, and of graduates. The university is solely an examining body; instruction is given in the colleges recognised by it, which are all the medical schools in the empire, and the colleges in London, and elsewhere in these islands, for superior instruction, not belonging to the other universities, and including most of the colleges of the Roman Catholics, Baptists, Independents, and Wesleyans. In London the colleges are University, King's, New, St. Bartholomew's and St. Thomas's, and the medical schools of St. George's, London, Charing Cross, Guy's, Westminster and Middlesex Hospitals, and the Hunterian School of Medicine. These give certificates of the students having passed through the required courses in the faculties of arts, medicine, and law. Those of engineering and architecture are not yet fully organized. The university has no theological character. For the matriculation, examination, or preliminary examination on admission to the university, no college certificate is necessary. The senate appoints examiners in the branches of the several faculties, and the examination, which is private, is as far as possible in writing, or of a practical character, oral examination being avoided, unless indispensably necessary. The examinations are of two classes, at the option of the candidate, an ordinary examination, in two classes, and an examination of a higher character for honours. To those passing this latter examination are alone given the scholarships and medals of the university. The examinations are very severe, and few go up for them; but those who do are generally young men of great abilities, and a large proportion pass in the superior classes. There are a general matriculation examination, examinations for Bachelor and Master of Arts, Bachelor and Doctor of Civil Law, two for Bachelor of Medicine, and one for Doctor of Medicine. The graduates possess very few privileges, but the degrees are highly valued. Latterly the degrees are given in public by the chancellor, in the presence of the graduates.

Superior instruction is given in London by the three colleges of University (for all sects), King's (for Church of England men), and New College (for Independents). The latter teaches only humanity and theology; but the others teach humanity, philosophy, medicine, law, engineering, and architecture, and have a full body of professors. The professors are chiefly paid by a proportion of the fees from pupils. The instruction is given by lectures, and weekly and sessional examinations are held. At the end of the session a grand examination and distribution of prizes takes place. The students are not obliged to be matriculated in the University of London, and many of them proceed to Oxford and Cambridge, in order to carry off the emoluments of those rich foundations. No system of moral discipline prevails in these colleges, the members of which reside where they list. These colleges are not under the control of the government, and belong to private subscribers, who appoint a council for their management, though the real administration is vested in the senate of professors.

Of public grammar schools for boys there are about twenty-five. The chief are Westminster, University, and King's Colleges, Merchant Tailors, St. Paul's, Charterhouse, Christ's Hospital, City of London, Mercers, the Philological.

The grammar school answers to the College Royal and Gymnasium of the continent. The endowed schools are not under the control of the government, and there are many private schools. The endowed schools have exhibitions or scholarships attached to them for the maintenance of pupils in the universities of Oxford, Cambridge, and London, and the fees are generally low, and in some cases the education is gratuitous. At Westminster, the Charterhouse, and Merchant Tailors, many of the wealthy classes are brought up, and most of the schools have produced many eminent scholars. In the grammar schools the basis of instruction is a hard and close training in the Latin grammar and rudiments, as a means of securing habits of attention, industry, and perseverance, and whatever may be the opinion as to the form of education, the result, by which we are to judge, and not by the form, proves that Englishmen, in their minds and in their habits of mental, political, and social discipline are as well trained as men of any European nation. Besides Latin, instruction is given in Greek, French, German, and other branches of education. In many of the large schools the lads at the option of their parents receive less classical instruction, and their education is of a more commercial character. As a general practice the minds of the younger boys are not quickened, but they are in preference kept to those studies which will train them in habits of industry. The boys of sixteen and seventeen are encouraged to a greater exertion of the higher faculties, and are allowed to compose themes, orations, and verses in English, Latin, Greek, French, German, and Hebrew. Each school has a yearly display of its more promising pupils on a speech day, and at Westminster a Latin play is performed at Christmas. It is considered the development of the powers of imagination and of judgment can best take place at an advanced age, and the cultivation of these, as well as the acquisition of languages and other accomplishments, is left for the period of university study.

Beneath the grammar schools are the boarding schools kept by private persons, and which are seldom on a par with the National and British and Foreign Schools, unless those of a higher class, where every branch of education can be obtained on making extra payment for it. The society schools generally labour under a want of teachers, and much of the instruction is given by pupil monitors. The teaching embraces reading, writing, spelling, English history, geography, lessons from objects, drawing, and an extensive course of theology in the form of hymns, prayers, catechisms, bible readings, and bible geography.

Of lower schools for boys and girls there are about 50 foundation schools; 700 national and parish schools; and 200 British and Foreign schools. Many of these have infant schools attached to them, and are of a larger class. Of Sunday schools there are about 700 belonging to the church. The number of Ragged schools is 90. The number of children in the church day-schools is 65,000, and in the church Sunday-schools only 9000. The number of children in the British and Foreign day-schools is 30,000. The number of pupils in the Ragged day-schools is 16,000. The whole number of other Sunday schools is about 700, with 12,000 teachers and 130,000 pupils.

The schooling of a great part of the population ceases at fourteen or fifteen, and the counting-house, warehouse, or shop, becomes the school of mental discipline. The Literary or Mechanics' Institution affords in its evening classes the means of continuing cheaply scholastic instruction, and provides classes of French, German, Latin, Italian, natural philosophy, drawing, singing, recitation, music and dancing. The abundance of books in private hands and in the libraries of the institutions, and the requirements of instruction for the discharge of political duties, are great encouragements to reading among the youths and young men, and many avail themselves fully of the opportunities at their disposal. With many defects in English institutions the practical and working results will be found by the careful observer highly favourable when compared with those obtained elsewhere.

The schooling of girls is almost without exception very expensive and very bad. Music, drawing, dancing and French are professed to be taught in all schools of any pretension, and are seldom learnt, and even if any proficiency be acquired in the ordinary requisites of school instruction, no care is taken for the discipline of the mind. Among the wealthier classes the girls are almost universally taught at home by governesses.

As a general fact it may be noticed that the industrial education of the girls has fallen off of late years among all classes.

Special education is provided for very extensively in London. The medical schools are numerous, and compete with each other. A supply of subjects for anatomical dissection is provided from the unclaimed bodies of those dying in hospitals, workhouses, or prisons. The College of Physicians examines for physicians; that of Surgeons for surgeons; the Society of Apothecaries for general practitioners of medicine and surgery; and the Royal Veterinary College for veterinarists. No course of study is required for lawyers, but solicitors have to pass an examination. There are some optional examinations for barristers and professorships of several branches of law. Engineering is provided for in numerous colleges so far as scholastic instruction goes; architecture in the Royal Academy, University, and King's and Putney Colleges; the arts in the Royal Academy and some smaller schools; music is the worst cultivated, and is in a low condition.

Miscellaneous.—The amount of customs duties paid by London is nearly 11,000,000*l.*; of postage, about 900,000*l.* The yearly value of house property is about 8,000,000*l.*, and the amount of poor rates about 650,000*l.* The amount invested in savings banks was, in 1850, about 4,500,000*l.*

Charities.—The provision made for the general relief of the poor is described under Poor Law. There is besides an unexampled number of institutions, founded by private benevolence for the relief of distress in almost every form. Many of these are described under the title of Asylums. Of the remainder it is impossible here to give an enumeration. We must refer to a most valuable work, "The Charities of London," by Sampson Low, jun.

The hospitals may be first named. They include St. Bartholomew's, St. Thomas's, Westminster, Guy's, St. George's, London, Middlesex, Charing Cross, University College or North London, King's College, and Marylebone. All these are medical schools. There are further, the Free, Seamen's (in the *Dreadnought* ship on the Thames), Jews, and German. Besides the above, for general diseases, there are special hospitals, as Lying-in (5), Insane (several), Ophthalmic (2), Small Pox and Fever, Fistula, Orthopœdic, Consumption (2), and the Lock. All these are under the management of subscribers, who, as governors, appoint the medical and other officers, and when they think fit recommend patients. Throughout the London charitable institutions the medical officers are unsalaried, but sometimes they derive emoluments as medical teachers. Admission to see the hospitals is readily given to strangers on application.

Besides the relief given by these hospitals to the immense number of out-patients, and exclusive of their in-door patients, are numerous smaller local institutions for out-door relief, including 39 dispensaries; and further, sanatoriums, sea-bathing institutions, lying-in, ophthalmic, aural, glandular, and truss or rupture relief institutions. The Humane Society keeps up a police and medical staff for the relief of persons found in the water and in danger of drowning.

The model dwellings for the poor, the baths and washhouses, and emigration funds, are provided by private benevolence*.

Ten institutions are provided for the reformation of unfortunate females, three for female and juvenile criminals, and one for the relief of discharged criminals. An hospital maintains natural children to relieve the mothers from further temptation. A society procures the discharge of persons imprisoned for small debts.

Miscellaneous institutions detect vagrancy, provide nightly shelter for the houseless in winter, give away coals, bread, and soup, and visit the necessitous in their abodes. The General District Visiting Society is a kind of propaganda society for converting the working classes to Christianity.

Benevolent establishments succour distressed needlewomen, dressmakers, and female servants.

The aged, the blind, the deaf and dumb, the insane, and the idiot, are well provided for. Several societies give pensions to the decayed members of the respectable classes. Each of the city corporations devotes large funds to charity, and each trade has its benevolent or pension society.

For orphans and for education the provision is large. Several great societies cause reading and writing to be taught to the English people, for whom no education is provided as a right by the state, and therefore it is thus afforded as an alms. These school-societies are the National for the Church, the British and Foreign for Dissenters, the Wesleyan, the Congregationalist, the Roman Catholic, the Jewish, and the Infant. The schools are supported by the payment of a penny or twopence weekly from each child, the subscription of neighbours, a slight grant from the society, and a gratuity from the government. The government now gives aid for building schoolhouses, and maintaining the normal colleges. Of these there are several in London. The National Society in 1847 had 6798 schools and 526,754 scholars, besides 237,848 Sunday scholars. The British and Foreign School Society likewise carries on its operations on a large scale. Several societies publish school-books and maps.

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* See post, article Baths and Washhouses and Houses for the Labouring Poor.

The Ragged schools are for the poor children who can neither dress decently, nor pay the weekly penny. These schools, formed within the last three or four years, have been the means of reclaiming many outcasts. Some of these schools are largely frequented by young thieves. The times of teaching are suited to the irregular habits of the inmates, and the endeavour is to give them a moral and industrial training. Some of the boys have been fitted to be emigrants. These schools are likewise open for adults, and generally they labour among those classes who, from the neglect of the state, are brought up to a life of vagabondism, and to prey upon the rest of the community. These schools receive no help from the state, but are wholly dependent upon voluntary contributions. There are nearly a hundred of these schools, and in which a thousand teachers gratuitously labour.

The Sunday schools are another great monument of voluntary exertion. In every one of the Society-schools, and in every dissenting chapel, a Sunday school is held, the teachers in which are volunteers. Throughout England there are 70,000 of these schools, with about 2,000,000 of scholars, of whom a large proportion are in the metropolis. In these schools the defective instruction in the Society-schools is partly supplied.

All these charitable institutions are regularly organized, and if they afford occasion for ostentation and display, at any rate they are the means of awakening the apathy of the community to the discharge of the social duties. The anniversary dinners and meetings become as much the holidays of the better classes, as occasions for beneficial exertion, and thus the co-operation and good feeling of all ranks of the commonwealth are engaged, from the prince to the beggar. That there are evils attendant on such a system, all will expect who know that human nature has imperfections; but none who think rightly can see its working and fail to acknowledge the vast amount of good. The burthen is, of course, unequally divided, and those most willing have the greatest share. The same benefactors contribute to every charity; the same devoted men and women are teachers in the Sunday-school, the ragged school, and district visitors; and those who give their mite, will, at the same time, be found working-up clothing, or providing comforts for the sick.

Poor Law.—In the vast nation of London there must be, from many causes, a large number of poor for whom a provision becomes necessary. The aid of various charities is afforded to a great extent, and there is an ample public provision. The stranger, who sees the squalid Irish and other beggars who infest the streets, might doubt this, but on no subject is it necessary for him to be so cautious in trusting to appearances. For every one food, shelter, and clothing are provided, and the law prohibits begging; but there will always be some who prefer begging to work, the more particularly when begging is a lucrative trade. As the beggar takes care not to ply his vocation in the hearing of the policeman, and the private person addressed is either unwilling, or has not the time to cause the criminal to be taken into custody, the army of beggars carries on its operations with little interruption, or an occasional imprisonment in the House of Correction is only treated as a slight evil attendant on a life of sensual indulgence. The Irish, from preference, are clad in tatters, and walk barefoot; the smaller number of English beggars array themselves expressly for their performance, and if they have not some deformity assume it. They likewise hire infant children at a considerable expense. They prey, in particular, upon the mechanics and their wives, who, occasionally subjected to real privations, benevolently say that perhaps they themselves may some day be brought to wretchedness, and that the beggars may truly be in want, and if not, a penny will do no harm. To impose upon the mechanics the sham Lancashire weaver, with his large household, makes his regular round of the courts and alleys, proclaiming in a loud voice and with rhetorical skill the circumstances which prevent him from earning a livelihood by work, and a shower of halfpence answers his appeal. On Saturday nights he, his wife, and children are dressed up cleanly and neatly, with faces well washed and hair well combed, holding boxes of matches in their hands, and with down-cast looks, as if ashamed to beg.

To every beggar, however urgent his appeal, and whatever guarantee he may offer of its truth, the stranger must thoroughly shut his ears and his pockets. If he is in doubt lest he should turn away any case of real distress, let him subscribe to the Mendicity Society in Red Lion Square, who will supply him with tickets, to be given as relief instead of money, and who give food only to those who are found to be deserving. The beggars have been known and seen to give these Mendicity tickets to the really poor. The police, too, can be called upon to take charge of a beggar, and to see him on his way to the poorhouse or the House of Correction.

The whole of London is divided into large districts for the relief of the poor, called unions, consisting of a single large parish or of several small parishes. Each of these is governed by a Board of Guardians, chosen by the ratepayers. Each union has a large building, called a workhouse, which provides for aged men and women, sick and disabled men and women, wives deserted by their husbands, single women lying-in, orphans and illegitimate children, and all persons unable to obtain work and destitute of the means of subsistence. A department called the casual or vagrant ward is for the relief of wanderers, who either have not or say they have not means of finding food and shelter for the night. This is a right which can be enforced at once on application before the nearest civil magistrate. For the children separate establishments are now being formed in the neighbourhood of London, with suitable schools, workshops, and play-grounds, where they may be brought up industriously. The insane poor are sent to the County Lunatic Asylums, established expressly for them, and where every care is taken for the restoration of their minds. The asylums for the county of Middlesex are at Hanwell and Colney Hatch.

The aged poor are provided for comfortably, but not luxuriously, as it is not the intention they should enjoy the same advantages as the frugal and industrious. Able-bodied men and women are only provided with such a quantity of coarse and unsavoury food as is sufficient to sustain life, as it is not desired to encourage them to remain without work or in a state of dependence. It is sometimes made a means of misrepresentation that the prisoner and the convict are better fed than the pauper, whereas the larger allowance made to criminals is only enough to maintain life under the depressing influence of imprisonment. It is therefore perfectly preposterous to compare the conditions. The work to which paupers are put is such as does not interfere with the labour market, chiefly stone-breaking, and it is a matter of course that workhouse labour affords little or no revenue towards meeting the expenses. The discipline of these large establishments is necessarily simple and strict. The inmates are required to stay within the walls, are dressed for cleanliness in the workhouse dress, and are separated into various classes, though not always to such an extent but that the evil influence of idlers, drunkards, convicts, vagrants, beggars, thieves, prostitutes, and other bad characters, is strongly felt. When a person applies for relief to a board of guardians, if he is only a casual sojourner in their district, it is their duty to cause him to be conveyed to his birthplace, a change which by no means suits the Irish vagrants, who make their reappearance at as early a date as possible. The Irish reaper, however, remits his earnings to Ireland by post-office order, and gets a free passage as a pauper.

The regular vagrants frequently take advantage of the casual wards of the workhouses in turn to get their night's lodging free, going forth in the morning to get their food by begging or thieving. As they wander about the union officers and police can seldom get a case against them to secure their punishment; and though they are searched to find their money they generally manage to hide it succesfully.

In some cases relief is given out of doors, but to as small a degree as possible, the object being by the restraint of the workhouse to debar persons from seeking help unnecessarily, and even the pittance of two or three shillings a week is sufficient to tempt an Irish family to live in idleness. In each subdistrict of the union is a relieving officer, whose business it is to examine the claims and circumstances of all applicants for relief within and without the union house. He visits the poor in their abodes, and in cases of utter illness or other need provides food and medical attendance.

The infirmaries of the Marylebone, St. Pancras, Lambeth, and other large unions, constitute large hospitals, and it is in these establishments the illnesses of the lower classes are really treated. The patients in the regular hospitals include few paupers, except for accidents or extraordinary diseases, but are many of them mechanics and domestic servants.

Although a warning has been given against beggars, and the system of relief has been described, yet there is often a large amount of suffering in London. The working population subject themselves to great privations to keep out of the workhouse, and sometimes the relieving officer, warned by neighbours of the necessity, is repulsed when offering help. Some from false shame when in need prefer living by begging to taking from the public fund, to which they have contributed, and which is provided for them. Sometimes the outcasts of crime pine away in their abodes; sometimes the victims of sensuality drop in their career of dissipation. Hence cases of utter wretchedness, and even of death from want of food, do, notwithstanding every care, sometimes harrow the minds of the public. These are not, however, to be taken as instances by which to measure the condition of the population.

Public Journals and the Times.—London, as compared with Paris and New York, is less distinguished for the number of its journals and their special distribution, than for the completeness of the journals themselves and the efficiency of their establishments. It is this which gives them a distinctive character and importance, and makes them a feature of metropolitan greatness particularly worthy of the examination of the stranger. The branch of literature which is styled the press is known under two heads, as newspapers and periodicals, between which the line cannot in each case be accurately defined, but which nevertheless have considerable distinctness of character. To the first class belong the daily and weekly newspapers, to the second the weekly, monthly, and quarterly publications, of which original dissertations form the chief feature.

The periodicals range from the volume review of the Edinburgh and Quarterly to the penny weekly sheet of the Family Herald, and in one shape or another they embrace the representation of every profession, party, sect, and shade of opinion. In the quarterly and monthly periodicals, Edinburgh shares with London, but with regard to both towns the contributors are not local, but drawn from all parts of the country. The whole mass of periodicals may therefore be considered together without distinction of origin.

The quarterly reviews consist solely of dissertations by men of eminence in their respective branches on important topics. The Quarterly, the Edinburgh, and the Westminster, represent the Tory, the Whig, and the Radical parties, and others less known the several religious sects; and there are special reviews for medicine and law.

The monthly publications consist principally of what are called the magazines. The numbers of a magazine bind up in the course of a year into two volumes, and contain chiefly portions of novels continued in series or short sketches, with poems and an occasional political article. There are besides special monthly publications for the navy, army, civil engineers, surgeons, veterinarists, pharmaceutists, chemists, naturalists, artists, antiquarians, bankers.

The political reviews rank among their contributors statesmen, historians, and the élite of science; the magazines, the poets and novelists. Some of the works of Dickens, Bulwer, and other novelists of universal popularity, have first appeared in the magazines.

Of the weekly periodicals it is more difficult to give a brief sketch. The Athenæum and the Literary Gazette are journals for the criticism of literature, science, and art, in all their branches, and the communication of information regarding them. Then there is a long series of journals for medicine, law, architecture, and music.

A class of publications, which may be represented by Chambers's Journal and the Family Herald, is published at a cheap price to supply the public appetite for wholesome reading. Beneath these come the penny sheets of novels, written to pander to the passions of the lower classes.

Each of the various publications we have named has its editor, and those requiring such assistance a sub-editor, and all give employment to a staff of contributors and translators, artists and engravers. The translations are chiefly of scientific and professional news; the literary publications, except those of the lowest class, who republish the common French novels, rarely employ translators.

A class of periodicals not before enumerated are the transactions and journals of the various scientific institutions. The several religious tract and temperance societies likewise issue numerous publications.

The newspaper press in its constitution differs much from that described.

The daily journals are those most important. The weekly journals reprint the news of the daily journals in a compressed form, and their distinctive character is derived from political articles, criticisms on literature and art, and occasional special communications. Several, as Sunday papers, give the news later than the daily papers of Saturday. In the weekly papers the sections of society unable separately to maintain the vast establishment of a daily paper have their special organs, and here we find the representatives of Absolutists, Tories, Conservatives, Protectionists, Whigs, Radicals, Republicans, Democrats, Jacobins, Economists, Socialists, High Church, Low Church, Roman Catholics, Presbyterians, Wesleyans, Reform Wesleyans, Independents, Unitarians, Jews, Deists, Pantheists, and Atheists. It is by this latitude of discussion that conspiracy and revolution are superseded, and each party hopes to conquer its adversaries by the overwhelming truth of its doctrines, and not by the exertion of physical power. Here the Celt abuses English domination, and the colonist advocates the dissolution of the imperial connection. The influence of these organs is great, and the ministry of the day has usually more than one representative among them. Many classes of the population have neither time nor money for daily publications, and the weekly paper is sought on the Sunday and carefully read. This class of publication has therefore large resources at its command, and is enabled to enlist men of great attainments among its contributors.

A weekly newspaper is managed by an editor and sub-editor, with several assistants for the Saturday's transactions, and there are usually regular correspondents or contributors for particular departments, for a political article or letter, for theatrical and musical criticism, and for sporting communications. Many of these parties hold other engagements on the press.

One weekly publication, the Illustrated News, keeps a staff of artists and engravers to supply the materials for the expensive woodcuts appearing in its pages.

The evening papers, since the establishment of the morning mails enables the morning papers to reach the country districts, are of diminished importance. They give the news from the morning papers with occasional additions, and some regular information of the day, and in periods of great excitement their exertions then keep pace with the public requirements for news. The ministry has always an organ, occasionally its chief organ, in this department of the press. The evening papers now publish about 4 o'clock, in time for the afternoon post, and during the sitting of parliament they give the debates up to a late hour in an after edition. They have their staff of editor and sub-editor, city correspondents, and in the session a corps of parliamentary reporters. The evening papers are the Globe, Sun and Express (liberal), and the Standard (conservative). There is likewise a shipping paper.

The morning papers are now six in number: the Times, Morning Chronicle, Morning Herald, and Morning Post, all representing various sections of the conservative party; the Daily News, which is the representative of the liberals, and the Morning Advertiser, likewise a liberal paper, but having its circulation almost exclusively among the licensed victuallers or publicans, to whom it belongs, and in aid of whose charities its profits are applied. The constitution and establishment of the five former papers have a general character in common, though with many modifications. Each belongs to a proprietary, which is not ostensibly known to the public, and each is managed by an administration, the members of which are not declared, nor is it the practice of a paper to allude by name to individuals connected with its contemporaries. At the same time the laborious pursuits of the editors, and their occupation in the evening, prevent them from appearing much in public, and the result is, so far as the mass of the public is concerned, a complete incognito, which, whatever its advantage, is paid for by an abnegation of all personal glory. The Thunderer becomes dead to the world, and as the secluded monk lives only for and in his order, so does the former live only in his newspaper. He gives up his individuality, he abjures the literary success, and the lasting fame, which his talents would achieve elsewhere; he sacrifices the applauses of senates, and the exercise of political administration. The journal wields the power, is flattered with the incense of public applause, and swallows up the glory in the long catalogue of successes. That this system contributes greatly to the power of the English press there can be no doubt, for all personal considerations are set aside, and every exertion is devoted to the advancement of the paper.

At the head of each establishment is the editor, or editor-in-chief, who may be said rather to have the general inspection, than the administration. He directs the policy of the paper, and is the centre from which its moral influence receives its impress. It is needless to say the few posts of this importance are not lightly given, and that, with an empire to choose from, talent and attainments of the highest class are considered indispensable in determining the choice. In writing the political or leading articles he has the assistance of gentlemen permanently engaged for the purpose, besides occasional special aid. For the administration of the office he has a sub-editor, who regulates the whole routine of the paper, and who secures the co-operation of the various special departments in the production of the daily work. This is an office which likewise requires mental resources of a very high order. In his immediate direction are the assistants who arrange the matter sent in from the several offices or contributors. The sub-editor's duties give him the supply and regulation of the printing office, and he has to make the most advantageous arrangements for that part of the paper not occupied with advertisements.

The sub-editor and his assistants receive from several sources leading articles, translations of foreign news, extracts from foreign, colonial, and provincial papers, communications from the foreign and home correspondents of the establishments, reports from the parliamentary and other reporters, and letters from private parties. There are besides the advertisements.

The city gives rise to a distinct department. The city office, in the neighbourhood of the Bank, has for its head a city correspondent or editor, whose duty it is, with his assistants, to prepare the money market or city article, and to watch the movements of the currency, the exchanges, the discount market, the stock and share market, the commercial interests of the country, and generally the state of trade at home and abroad. More or less in connection with the city correspondent are correspondents on the Corn Exchange, and in the markets for colonial and other produce. The paper likewise has regular correspondents in all the local markets of the metropolis to record the prices of articles of consumption.

The staff of foreign correspondents varies according to the resources of the paper and the exigencies of political events. The Times has lately kept correspondents in Paris, Italy, Vienna, Northern Germany, Madrid and Lisbon, besides others on roving commissions attending armies in the field. The correspondent at Paris occupies an important political position, and is provided with every appliance to enable him to supply daily the latest political and commercial news. Special expresses bring these communications from Paris to London in time for the morning papers. It has happened before now that political transactions affecting a people, although occurring in their own capital, have first been made known from London. Occasional correspondence is supplied from all parts of the world by persons in the confidence of the papers, and there is a regular organization to furnish advices in the quickest manner from the utmost ends of the earth.

Besides the political missions abroad, others are undertaken from time to time at home. Such were those on the condition of the Irish population, and on English agriculture by the Times commissioners; on labour and the poor in England by the Morning Chronicle commissioner; on the State of the English Manufacturers, and on the Encumbered Estates by the Daily News commissioners.

Each paper has a corps of parliamentary reporters, who attend the debates in the two Houses of Parliament, and in which many young men of talent are enlisted. Some of these are entered for the bar, others hold appointments on Sunday Papers, and thus obtain an income which induces them to adhere to the press as a vocation.

Besides these gentlemen there is in London a great number of casual reporters, whose contributions are paid by the number of lines they contain, and hence are called penny-a-liners. Although regular reporters are sent from the offices, whenever anything of importance is expected, yet a great mass of information relating to police-offices, inquests, fires, murders, accidents, and meetings, is obtained from the casual reporters, who, scattered over the metropolis, are ever on the look out for anything which may afford them the materials for a paragraph. They are to be seen on the fire-engines, proceeding to the fires, a whole pack is let loose on the scent of a murder, and it has been said that a man who falls down and breaks his leg is sure to find by his side two persons ready with sympathy—the medical student eager to secure him for his own hospital, and the casual reporter who makes the most anxious enquiries as to his name, address, family, and connections, that he may publish the fullest particulars in the morning papers.

The publishing office of a large paper has usually a distinct department for advertisements. Here payment is received for advertisements and a small ticket of receipt is given, but a great many advertisements come from advertisement agents, who, for a percentage transact the business of large establishments and individuals. These firms employ a considerable capital, but during the railway mania they suffered much by the large accommodation they afforded to the new schemes.

The newspapers are chiefly issued from the offices to newsvenders, some of whom carry on a very large business. Messrs. W. H. Smith and Son, in the Strand, take as many as 5000 of one weekly paper, and they supply a great number of provincial newsvenders throughout the island, sending down parcels by railway trains. The newsvenders deliver the papers to their town and country subscribers, and likewise sell them retail to chance customers. A large part of their business is in lending the papers to public institutions, coffee-houses and individuals by the day, sending them away by the evening's or next day's post; and in lending them by the hour to persons reading them at home.

Instead of the numerous cabinets de lecture of the Continent, the stranger will find but few in London. Here papers are hired from the newsvender, or by the lower classes borrowed from the public-house, which thus accommodates its customers. The periodicals will be found in the coffee-houses, and literary institutions, and those published monthly and quarterly are lent out from the circulating libraries.

The history of "the Times" newspaper and its machinery is a history of intellectual ability, industry, and enterprise, unwearied activity and pre-eminent success, both to the public and to the proprietors.

Previous to the year 1814 "the Times," like every other newspaper, was printed by hand at the common press, and at the rate of about 300 sheets per hour, printed on one side. The following is a brief review of the progress of printing machinery.

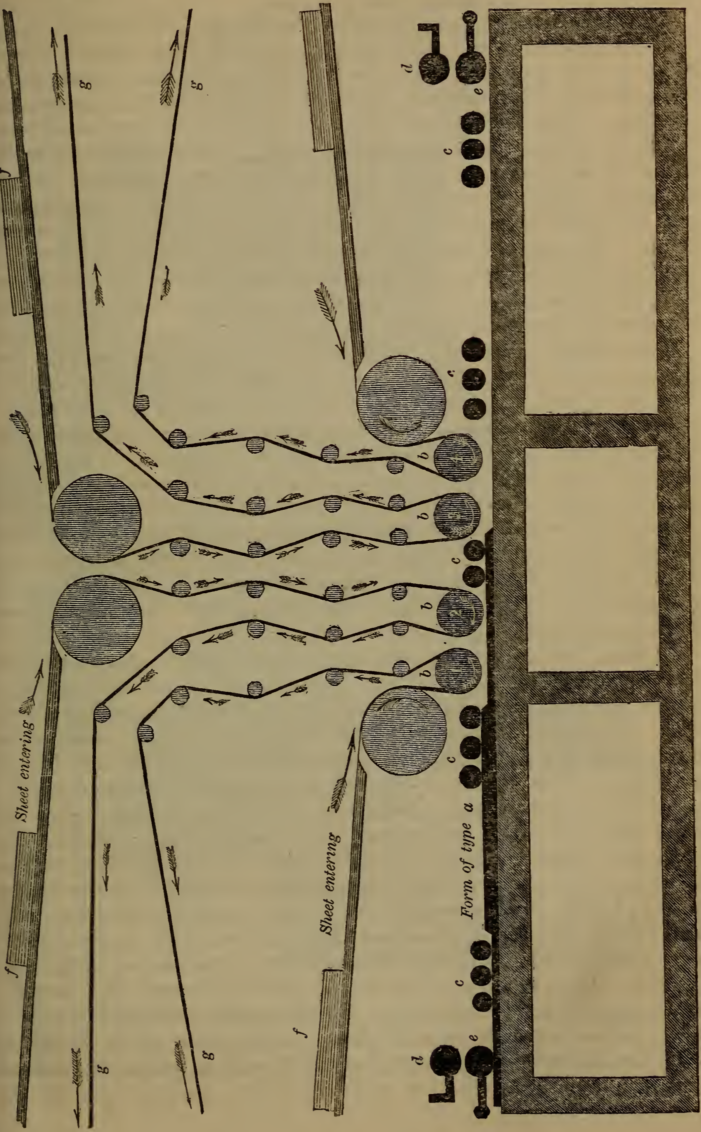
The first patent was obtained by Nicholson, in 1790, who then proposed placing both the types and the paper upon cylinders, and distributing and applying the ink also by means of cylinders; another plan was to place common type upon a table, which was passed under a paper cylinder. In 1813, Donkin and Bacon proposed placing the type upon a prism, and introduced "composition" rollers.

In 1814, Kœnig made the first working machine, and erected two of them at "the Times" office, each of which produced 1800 impressions per hour, and continued to do so until 1827.

In 1816, Cowper made a machine to print from curved stereotype plates; and, in 1818, one to print books and newspapers from ordinary type; which machines are now in general use.

Plate 1.

APPLEGATH AND COWPER'S "TIMES" MACHINE. 1827.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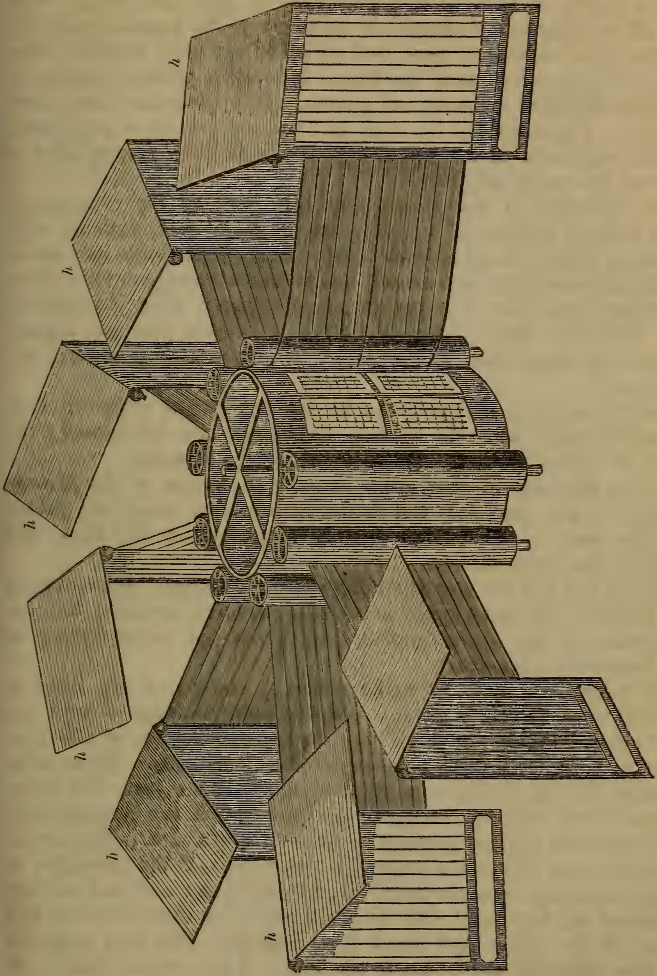
Sheet entering

In these machines he introduced the system of inking now so common. These machines printed from 2000 to 2400 impressions per hour.

In 1827, Cowper and Applegath conjointly invented the four-cylinder machine which Applegath erected for "the Times." (See plate 1.) It at once superseded Kœnig's machines, which were taken down. This machine printed from 4000 to 5000 impressions per hour. The diagram will give a general idea of these machines, which are still in use at "the Times" office. They consist of a table *a*, moved backwards and forwards under four iron cylinders *b* (called the paper cylinders), about 9 inches in diameter, which are covered with cloth, and round which the sheets of paper are held between tapes. The form is fixed on one part of table *a*, the inking rollers, *c*, lying on another part, on which they distribute the ink. Some of these rollers are placed in a diagonal position on the table, so that, as it moves backwards and forwards, they have a motion in the direction of their length, called the "end-motion," which, combined with the rotatory motion, causes the ink to be more effectually distributed. The ink is held in a reservoir or trough *d*, formed of an iron roller, called the ductor, against which the edge of an iron plate rests, and, by its pressure, regulates the quantity of ink given out. The ink is conveyed from the ductor-roller to the table by means of an elastic roller vibrating between them, *e*. The feeding is performed by four "layers-on," who lay the sheets of paper on the feeding boards *f*, whence they enter the machine between three pairs of tapes, by which they are conveyed round the cylinders, and thence to the spot, *g*, where the "takers-off" stand, into whose hands the sheets fall as the tapes separate.

In May, 1848, the last great improvement was introduced, when Mr. Applegath erected at "the Times" office a vertical machine, which produces the enormous number of 10,000 impressions per hour. (See plate 2, which gives a general idea of the machine in perspective, one of the feeders being omitted to show the position of the form.) This machine (see plate 2) consists of a vertical cylinder, about 65 in. in diameter, on which the type is fixed, surrounded by eight other cylinders, each about 13 in. in diameter, covered with cloth, and round which the sheets of paper are conveyed by means of tapes; each paper cylinder being furnished with a feeding apparatus *h*, having one boy to lay them on and another to take them off. The inking rollers are also placed in a vertical position, against the large cylinder, upon a portion of the surface of which they distribute the ink. The ink is held in a vertical reservoir, formed of a ductor-roller, against which rests two "straight edges," connected at the back, so as to prevent the ink from running out. It is conveyed from the ductor-roller by one of the inking-rollers, against which it is occasionally pushed.

Plate 2.



APPLEGATH'S "TIMES" VERTICAL PRINTING MACHINE. (10,000 sheets per hour.)

The type used is of the ordinary kind, and the form is placed upon a portion of the large cylinder, being fixed to it in a very plain but ingenious manner: a slab of iron is curved on its under side, so as to fit the large cylinder, whilst its upper surface is filed into facets or flat parts, corresponding in width and number to the width and number of the columns of the newspaper; between each column there is a strip of steel, with a thin edge to print the "rule"—the body of it being wedge-shaped, so as to fill up the angular space left between the columns of type, and to press the type together sideways, or in the direction of the lines; the type is pressed together in the other direction by means of screws, and is therefore firmly held together. The surface of the type thus forms a portion of a polygon; and the regularity of the impression is obtained by pasting slips of paper on the paper cylinders.

The operation of the machine is very simple: the "layer-on" draws forward a sheet of paper on the feeding board, until its edge is under a roller, furnished with tapes, which drops down and draws the sheet forward and downward, into a vertical position, when other rollers and tapes carry it round the paper cylinder, when it meets the type, which has been inked by passing in contact with the inking-rollers; the sheet then continues its progress until it reaches the "taker-off."

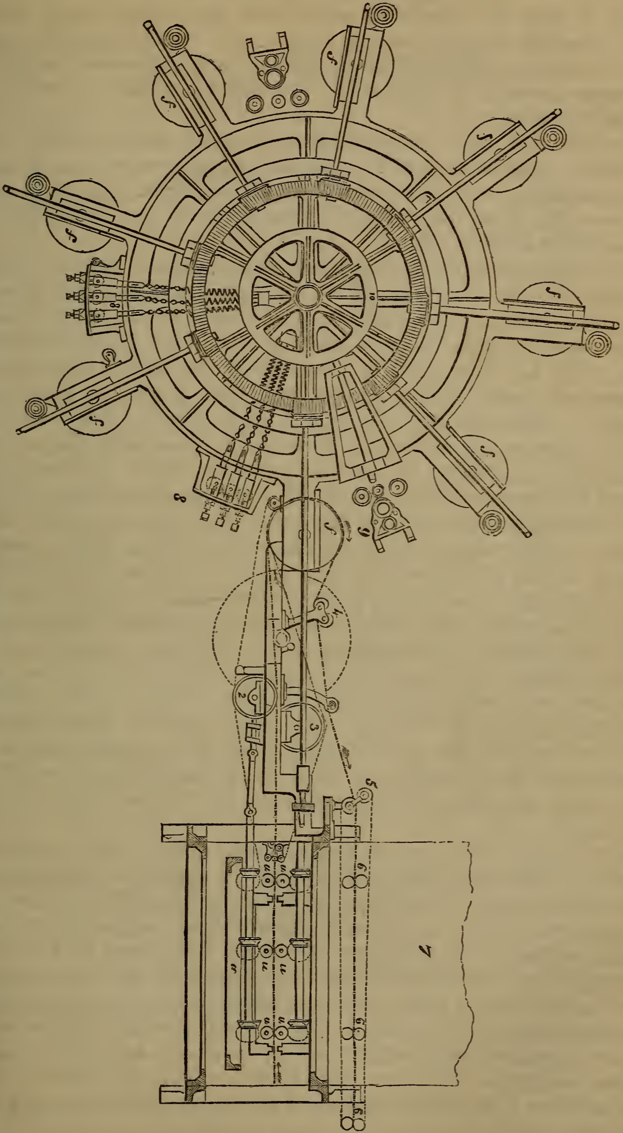
The following is a description of the engravings, plates 3, 4, 5, and will explain how the various movements are performed; the letters of reference are the same in each of these plates.

a, *a*, is the large vertical drum, forming the centre of the system, mounted on the shaft *b*, *b*, and driven by the bevel wheel and pinion *c*, *d*, the shaft of the pinion *d* being supported on the floor, and carried to the prime mover.

f,*f*,*f*,*f*,*f*,*f*,*f*,*f* are the eight impression cylinders, driven by the spur wheel *e*; the same speed is therefore secured between the circumference of the drum (with the type) and the circumference of each impression cylinder.

The columns of type, as we have already mentioned, are fixed in the four type holders *g*, *g*, *g*, *g*. Between the columns of type are the "rules," which are fitted into the top and bottom of the type holder in a similar way to a metal saw in its frame. These rules are made like the keystone of an arch, to fill up the space left at the junction of the columns, owing to the angle which the columns form with each other in their position as sides of a polygon. The centre rule in the type holder is a fixture, in order to avoid the possibility of the type escaping from its place, in screwing it up; and each column is jammed up from one end by a set-screw, as shown at top and bottom of the upper and lower type holders. The four pages of type thus prepared are bolted to the rings of the central drum. It will be observed that the impression cylinders are not arranged symmetrically around the central drum. A greater space is left between one pair than between the others, in order to give room to get at the type, which can only be done when it is in the position shown in the drawing.

Plate 3.—Plan.


f
f
f
f
f
f
f
f
f
8
8
10
g
4
2
3
5
u
u
u
u
w
u
u
u
6
6
6
7

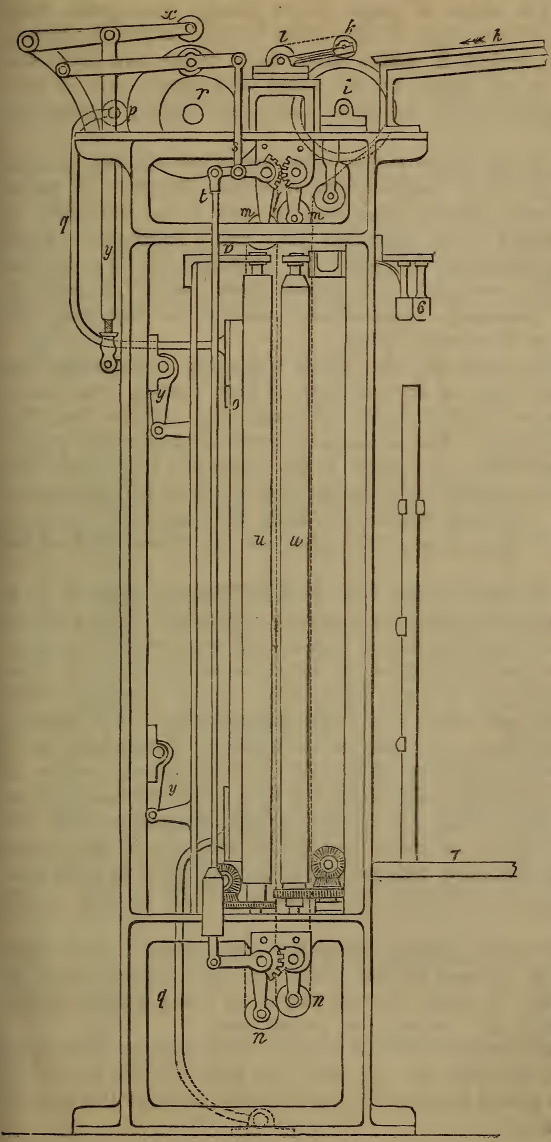
Each of the impression cylinders requires an apparatus for supplying it with the sheets of paper (one only being shown in the plan); and the vertical position of the type requires that the paper shall be also brought to a vertical position, and be moved laterally in its passage through the machine. This difficult problem is solved in the following manner:—

The sheets of paper are piled on the feeding board *h* (see end view of feeding apparatus, plate 4), and are pushed forward, one by one, by the attendant, over the centre of the feeding drum *i*, plate 4; *k*, *k*, are two small fluted rollers, fixed on the dropping bar, and driven by tapes, off the roller *l*, plate 4.

At the right moment this bar turns on its centre *l*, and *k*, *k*, drops, as shown in the drawing, and by its motion advances the sheet of paper between the rollers *i* and *l*. The motion of the sheet is then continued downwards by tapes passing around the rollers *m*, *m*, and *n*, *n*, plate 4. The paper is steadied in the whole of its course by numerous tapes, only a few of which are drawn to show their direction. The down tapes pass around the feeding roller and the smaller rollers *m*, *m*, and *n*, *n*, and carry the sheet with them, until its progress is arrested by two long narrow strips of wood *o*, *o*, covered with woollen cloth, and called "stoppers," one pair of which are advanced forward against the other pair that are fixed. The motion of this stopper frame is effected by means of the cam *p*, plate 4, which acts upon the arms *q q*, *q q*, attached to the frame. The rollers *m*, *m*, and *n*, *n*, plate 4, then (and, of course, the tapes with them,) open, and leave the sheet in its vertical position, held up by the stoppers. The opening of the rollers *m*, *m*, and *n*, *n*, is effected by their bearings being mounted in the ends of levers, and these levers are made to act upon each other by means of the toothed segments shown in the drawing. The cam *r*, plate 4, lifts the link *s*, which moves the top pair of rollers *m*, *m*, while the motion is conveyed to the lower pair, *n*, *n*, by the connecting rod *t*, which is loaded with a weight at bottom to keep the friction roller on the cam *r*.

To return to our sheet of paper, which we left held up by the stoppers. These are now relaxed, and the weight of the paper is taken by two pairs of small fingers, or suspending rollers, at the top of the sheet, which are brought together by a cam, and, pressing slightly together, hold the sheet up during the instant of time that the stoppers are relaxing, and until the three pairs of vertical rollers *u u*, *u u*, *u u*, plates 4 and 5, are brought into contact to communicate the lateral motion to the sheet. The vertical rollers are all driven at the same speed as the printing drum by means of bevel wheels and pinions, as shown. The three front rollers, *u*, *u*, *u*, are mounted in a hanging frame *v*, *v*, and the pinions at bottom are driven through the bevel pinions and the shaft *w*, *w*, which is made with a universal joint

Plate 4.—End View of Feeding Apparatus.



to allow of the motion of the frame *v*, *v*. The back rollers are driven in a similar way, but their centres are stationary.

The proper motion is communicated to the hanging frame *v*, *v*, by a cam similar to *p*, acting upon the lever and friction pulley *x*, the motion being communicated through the levers *y*, *y*, plate 4. Immediately on the rollers being brought into contact with the paper, it is advanced by their motion into the mouth of two sets of horizontal tapes, which pass round the drums 2 and 3, (also driven by gearing,) and carry the sheet onwards towards the impression cylinder *f*, where it is printed, and whence it returns in the direction of the arrows, the dotted line showing its path. The sheet of paper in its passage out meets with another set of endless tapes at the roller 4, plate 3, which assist it out as far as the rollers 5, where these tapes return and leave the sheet to complete its course by the action of a single pair of suspending tapes at the top of the sheet, and pressed lightly together by the pulleys 6.

On arriving at the outer pulley these tapes are forcibly pressed together by a lever and stopped, and thus hold the sheet of paper suspended and ready for the attendant to draw down, and place on the taking-off board 7—an operation very easily performed. Each of the eight impression cylinders is provided with a similar feeding apparatus, and the same action takes place successively at each, thus producing eight sheets, printed on one side, for each revolution of the central drum.

We may now mention the plan which is adopted to counteract the deviation of the faces of the columns of type from a true circle. Strips of paper are pasted down the impression cylinder, in width equal to each column. Other narrower strips of paper are pasted in the centre of these, and other strips, narrower still, until the surface of the impression cylinder becomes a series of segments of smaller circles, agreeing sufficiently with the required curve, to produce a perfect impression of the type over the whole width of the column.

The ink is supplied to the type by three inking-rollers 8, 8, 8, plate 5, placed between each two impression cylinders. These rollers receive their ink from revolving in contact with a curved inking-table, placed on the central printing drum opposite to the form of type. The ink is communicated to the inking table by two vibrating rollers alternately in contact with it and the ductor-roller. The ductor-roller 9, plate 3, forms one side of an ink-box from which, as it revolves by the bevel gearing 10 and 11, it withdraws a portion of ink. The two ink-boxes are kept full by a reservoir placed above them. The inking-rollers are caused to press in contact with the inking-table by means of coiled springs, as shown, and their brass bearings are also furnished with set-screws to hold them in close contact with the type, as it passes, in a similar manner to other quick machines.

The spindles of the inking-rollers are also provided with small friction wheels at top and bottom, which run upon a brass bearer on the central drum; by which they are kept from being drawn into the drum by their springs, except at the proper time.

There is an advantage incidental to the vertical position of the type and the paper; viz., that the ink does not sink into the type as it does when it is placed horizontally, and on that account the type is kept much cleaner.

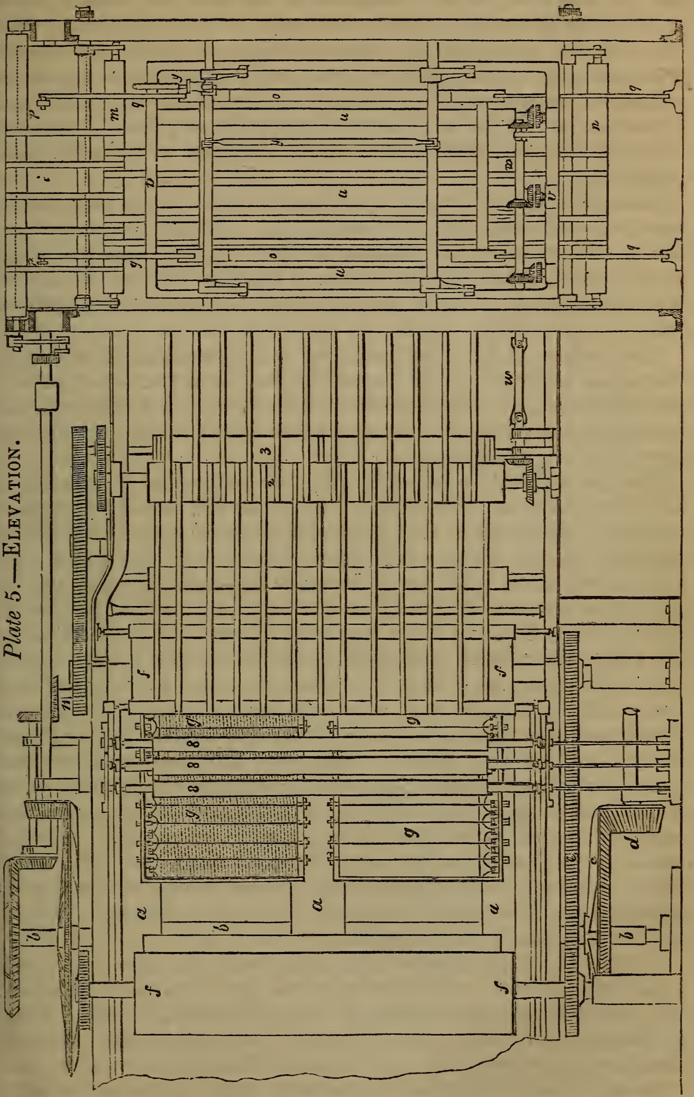

a
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Plate 5.—ELEVATION.

In looking at a copy of the *Times*, it will occasionally be observed that the impression is not exactly in the centre of the paper. Now, the only wonder really is, that it should be so nearly true. The type and the paper move at about the rate of 6 feet per second, so that an error in the arrival of the sheet of paper to the impression cylinder of one-seventieth of a second would cause an error of one inch in the margin. Yet so accurately is this performed, that the waste of sheets is considerably less with this machine than with the old horizontal ones.

Some little difficulty was experienced at first in carrying on the paper, when vertical, without buckling it. This difficulty was conquered by introducing an additional roller, to give the paper a slight angle, instead of drawing it out in a straight line, which had the effect of stiffening it, on the same principle as corrugating a plate of iron.

The produce of this machine might readily be doubled, by having two forms of type on the central drum, instead of one (were it desirable for want of space for two machines, or other reasons), and the addition of eight other laying-on boards and feeding drums in a story above the present ones.

The following are interesting statistics relative to the printing of the *Times:*—On the 7th of May, 1850, the *Times* and *Supplement* contained 72 columns, or 17,500 lines, made up of upwards of 1,000,000 pieces of type, of which matter about two-fifths were written, composed, and corrected after 7 o'clock in the evening. The *Supplement* was sent to press at 7·50, P.M., the first form of the paper at 4·15, A.M., and the second form at 4·45, A.M.; on this occasion 7000 papers were published before 6·15, A.M., 21,000 papers before 7·30, A.M., and 34,000 before 8·45, A.M., or in about four hours. The greatest number of copies ever printed in one day was 54,000, and the greatest quantity of printing in one day's publication was on the 1st of March, 1848, when the paper used weighed 7 tons, the weight usually required being 4½ tons; the surface to be printed every night, including the *Supplement*, was 30 acres; the weight of the fount of type in constant use was 7 tons, and 110 compositors and 25 pressmen were constantly employed. The whole of the printing at the *Times* office is now performed by four of Applegath and Cowper's four-cylinder machines, and two of Applegath's new vertical cylinder machines.

SECTION 6.—LEGISLATION AND GOVERNMENT.—The metropolis is the seat of the central government in its various relations. The United Kingdom of England, Wales, Scotland, Ireland, Town of Berwick-on-Tweed, the Orkneys, Shetlands, and Western Islands, is governed by the Imperial Parliament. The isles of Man, Jersey, Guernsey, Alderney, Sark, and their smaller islets, are only partially subject to the control of the Parliament.

The protectorate of the Ionian Islands, Mosquitia, the Hawaian Islands, and other semi-dependencies, is exercised through the Colonial Office, without connection with any other department. The Indian Empire is ruled through the Board of Control and the Board of East India Directors, and the Arctic American territories through the Hudson's Bay Board. The colonies are divided into three classes, those having legislative assemblies (as those of North America, Australia, New Zealand, the Cape, Jamaica, and most of the West Indies), Crown colonies (as Ceylon, Gibraltar, Malta, Heligoland, Mauritius, West Africa, Aden, Hong-Kong, Labuan, the Falklands, Port Essington, Trinidad, and some of the West India Islands), and possessions (as Hindostan, &c). The Crown colonies are absolutely subject to the English Government and Parliament; the last class have the power of regulating their own expenditure and making their own laws, subject to the control of the home Government.

The Parliament consists of the hereditary chief magistrate, under the title of King or Queen, and in whose name, but on their own responsibility, the ministers forming the executive exercise their functions; of a House of Lords, consisting of hereditary peers, 28 peers elected by the Irish peers for life, 16 peers elected by the Scotch peers for each parliament, and 30 archbishops and bishops of the Established Church in England and Ireland; of a House of Commons, consisting of about 650 members, chosen for each parliament by various classes of electors in the three great divisions of England, Scotland, and Ireland, for districts of shires or borough towns, the number of members for each district being one, two, three, or four. The operation of the qualifications is very irregular. In some boroughs every working man is an elector, as being a freeman; but generally a great number of working and respectable men, not householders, are shut out: and in the counties only the landed and farmers' interests have the electoral franchise. The city of London returns four members; the districts of Middlesex; South Essex, North Surrey, and West Kent, two each; and the metropolitan boroughs of Westminster, Southwark, Marylebone, Tower Hamlets, Finsbury, Lambeth, and Greenwich, two each. The whole of London has not the borough franchise, as a large part to the west of the city of Westminster is excluded; so are the Essex suburbs, and other outlying districts. The franchise of freemen, but here limited to a selected class called liverymen, only exists in the city of London.

Virtually the queen and her ministers, or the crown, or government, has no immediate share in the parliament, having given up the power, though not the right, of putting a veto on any measure. The crown names new peers from time to time, and occasionally, to strengthen a party without increasing the stock of hereditary peers, the eldest son of a peer is called into the House of Lords. The political faction in power, and exercising the functions of the crown, has great patronage, which is employed, as elsewhere in representative countries, in promoting the interests of its own faction, and thereby the House of Commons is influenced. Except in times of great excitement, political power is left in the hands of the partymen of all grades, the politicians by profession, and the great body of the public, who belong to no faction, and either do not exercise the electoral franchise, or do not possess it, leave the supervision of the government to the press, through which the influence of public opinion is brought to bear, and the proceedings of the dominant faction restrained.

For above two hundred years the executive government has been in the hands of a political faction, generally either Whig or Tory, and the exercise of power is reposed in a body of ten or fifteen ministers of state, forming the Cabinet Council, and of whom one is the Premier or cabinet minister. The cabinet usually consists of the First Lord of the Treasury, and of the Chancellor of the Exchequer, and another finance minister; of the Lord High Chancellor, as head of the law; of Secretaries of State for the Home, Foreign, and Colonial Departments; of the President of the Board of Control for India, and of the First Lord of the Admiralty. The number, however, varies. The next class of political personages are ministers of state not cabinet ministers, as the Secretary at War, Secretary for Ireland, President of the Board of Trade, Master of the Mint, &c. The third class consists of the Secretaries of the Treasury, Admiralty, India Board, Board of Trade, &c., and the Under Secretaries of State. The fourth class consists of Lords of the Treasury and Admiralty. All of these are peers or members of parliament.

The above constitute the political hierarchy, the members of which are removable when their own personal influence or that of their faction declines. Beneath them, however, is a permanent staff of officials. These consist in each office of an under or assistant secretary, chief clerks, and clerks of the superior departments, arranged in several classes. Beneath these, again, come the whole body of government subordinates, the clerks of the Post Office, Customs, and Inland Revenue, the executive officers of their administration, the letter carriers, excisemen, and Custom-house officers. In each office there is generally a regular promotion in the several ranks, and a scale of superannuation provided by mutual contribution, and, except in cases of absolute dishonesty, the parties are virtually irremovable.

Where the heads of the department do not belong to the political hierarchy, they consist of commissioners, named from among retired members of parliament or political personages, as the Commissioners of Customs, Inland Revenue, Poor Law, Police, &c.

In the Cabinet Council resides the supreme power of the executive; but generally, unless on some line of policy laid down by the Cabinet, each minister is supreme in his own department; and in Downing Street is to be found the secretary who has ordered a fleet to coerce a foreign state, the president who sent an army into Afghanistan, the minister who has given representative institutions to a country larger than a European kingdom, and with a population more considerable than that of many sovereign commonwealths. The political secretary and under-secretary cannot, however, embrace the whole of the details, and much of the power of each department resides with the permanent under-secretary, chief clerk and clerks, each of whom has his own functions, perhaps an important country under his influence.

In everything that relates to expenditure, and it may be said to administration, the Board of Lords and Secretaries of the Treasury is supreme; and as all measures involving outlay must come to them, they have the means of exercising a control over other departments. One of the Secretaries of the Treasury is known as the Whipper-in, to whom is intrusted the disposal of the patronage of the government among members of the House of Commons, with the view to secure their presence and their votes. In consequence of the demands of the numerous partisans the Treasury lays hold of the patronage of every appointment it can, in order to supply the applicants. The power of the Treasury Board is more particularly exercised in what are called the revenue departments, as the Customs, Inland Revenue, and Post Office, and it forms the tribunal of appeal in all disputes with the latter boards.

The Home Department has charge of the administration of justice and criminal police, in conjunction with the Lord High Chancellor, the Attorney General of England, and the Lord Advocate of Scotland. The Lord Lieutenant and Secretary of State for Ireland exercise the government of Ireland, under the home authorities. The Foreign and Colonial Departments, the Army or War Department, the Admiralty, and the Ordnance or Artillery and Store Department, are nearly independent, except in their relations with the Treasury. The Board of Control supervises the Board of Directors in the government of India, and exercises an independent political influence in that country. The Board of Directors, elected by the proprietors of East India stock, have the patronage of all except the highest Indian appointments, and regulate the internal administration. The President of the Council is the minister of education. The Board of Trade has under it the statistical department, a branch for the supervision of railways, one for the supervision of steamboats, the registration of patterns and designs, and the registration of returns of prices of corn. The office of Woods, Forests, and Land Revenue has the care of the national property, and the direction of public works and buildings not under the Admiralty or Ordnance. The crown estate of the ancient Duchy of Lancaster, and the Prince of Wales' estate of the Duchy of Cornwall, are made separate departments.

The hours of attendance in the various government offices vary. They are to be found in the Post Office Directory, and the pocket-books. As each department has its separate office, it is as well to ask for the office required of the messenger at the entrance of the buildings. Applications to the boards, or superior departments or authorities, should be addressed in writing, and the answer has a number attached to it, which should be noted in any subsequent communication. In case of complaint against any subordinate officer of government, application is to be made first to the head of the office, then to the board, and afterwards to the Lords of the Treasury. It is not expedient to rely too much on the influence of a member of parliament, as he has, in most cases, too many demands to make for his constituents to be unfettered.

The House of Lords forms the supreme court of justice in all causes arising within the parliamentary territories in these islands; but the jurisdiction is virtually exercised by the Lord High Chancellor and other peers who are lawyers. It is likewise the supreme criminal tribunal for trying kings, queens, ministers, governors-general, and peers and peeresses. Before it were tried Queen Caroline; Warren Hastings, Governor-General of India; and Lord Melville, First Lord of the Admiralty. The Privy Council, or rather the judicial committee of it, consisting of such members as have been judges at home or in the colonies, is the supreme court of justice in all civil causes arising within the extra parliamentary territories of Man, Jersey, &c.; in India and the colonies; likewise in admiralty causes, causes of the Established Church of England and Ireland, and in patent causes. Before this tribunal, which partly answers to the Supreme Court of the United States, are tried causes arising among the emperors, kings, provinces, and colonies of the English Empire.

The peculiar feature of the English government is, that the hierarchy and power of the executive ceases with the political departments, and that the greater part of the local government is virtually in the hands of independent authorities. The central government cannot interfere directly with the government of a county, town, or township; and in England, Scotland, Ireland, Man, or Jersey, it must act according to the laws or forms of each country. Thus a degree of federal independence not existing in any democracy is to be found throughout the English Empire, and which is one of the anomalies among the many which will strike the eye of an observer. The Lord-Lieutenant of a county, as of Middlesex, Essex, Surrey, and Kent, is named for life by the dominant faction holding the executive, and he presents to the Lord High Chancellor the names of the gentry who are appointed justices of peace for life, and who exercise the magistracy and raise and expend the county taxes. The Lord Mayor of London is nominally submitted for the approval of the government; but in all other towns even this form is not gone through, and the municipalities are totally independent of the government, as are likewise the townships or parishes, and which levy their taxes without reference to the government. The several judges and magistrates are irremovable, and exercise a large amount of patronage.

In London are seated the superior Courts of England and Wales; those of equity, or for causes beyond the prescriptions of law; the Courts of the Lord High Chancellor, Master of the Rolls, and Vice Chancellors; those of law, whether oral or common law, or statute law, as the Queen's Bench, Common Pleas, and Exchequer; of Admiralty; of Wills and Ecclesiastical Causes, as the Court of Arches, Prerogative Court, and Consistory Court. The Queen's Bench has special jurisdiction in criminal and municipal cases; the Common Pleas, in electoral registration cases, and virtually in commercial cases; the Exchequer, in Crown revenue cases. The Court of Exchequer Chamber is a court of civil appeal on points arising between the common law courts, and there is a court of criminal appeal. These courts are held by the 15 judges of the three common law courts, who likewise hold the local assize courts for civil and criminal causes. The three common law courts sit separately in the city of London. The assize courts in which metropolitan causes are tried are Croydon and Kingston for Surrey, Maidstone for Kent, and Chelmsford for Essex.

Municipal Arrangements.—Looked at from a constitutional and legal point of view, the metropolis consists of the ancient cities of London and Westminster, the borough of Southwark, and the modern parliamentary boroughs of Marylebone, Finsbury, the Tower Hamlets, Lambeth, and Greenwich. Of all these, London alone has a municipal government, the jealousy of the administration refusing this right to the whole metropolis and the separate boroughs. London returns four members to serve in the Parliament of the United Kingdom; each of the other places two. The right of voting is vested in the occupiers of houses, counting-houses, warehouses, or buildings, of the clear yearly value of 10*l.*, who are on the register of voters. To entitle him to be placed on the register, the elector must have occupied his house for twelve months previous to the 31st of July, must be rated to the poor, and have paid before the 20th of July all poor-rates and assessed taxes due before the 5th of January, and have resided within the borough, or within seven miles thereof, for six months before the 31st of July. In London, freemen, being liverymen, who were admitted before the 1st of March, 1831, or who have been admitted since by reason of a title from birth or servitude, and who reside within seven miles of the city, and are registered, form the old constituency, and are entitled to vote.

The registers of voters are formed from lists of the occupiers made out annually by the overseers of each parish, and of the liverymen of London by the clerks of the companies. The lists of London, with those of the other boroughs in Middlesex, are revised by barristers appointed by the Lord Chief Justice of the King's Bench; those for Southwark and Lambeth by barristers appointed by the senior judge, who goes the Surrey assizes. These barristers hold courts in September or October every year, to expunge the names of those citizens who on technical grounds have been objected to, and insert the names of those who have been improperly omitted, and who claim a right to vote; and from their decision an appeal lies to the Court of Common Pleas.

There are several local courts for the administration of civil and criminal justice in the city of London and its neighbourhood. The civil courts within the city are the lord mayor's court and the sheriffs' court. The criminal courts are the Central Criminal Court, the Guildhall sessions, and the police courts. In the neighbourhood of London the local civil courts are the different county courts; and the criminal courts are the Westminster and Middlesex, Southwark, Tower Hamlets, Kent, Essex, and Surrey sessions, and the police courts.

The Mayor's Court is held at Guildhall, nominally before the lord mayor and aldermen, but really before the recorder. It is a court of law and equity, and has jurisdiction over all personal and mixed actions arising within the city. Its principal business is in the customary proceeding of foreign attachment. If an action is commenced in the mayor's court for a sum of money, and the officer returns that the defendant cannot be summoned, and the plaintiff surmises that another person within the city is indebted to the defendant, he has process against the third person, called the garnishee, to warn him to come in and answer whether he be indebted in the manner alleged. If he comes and does not deny the debt, it shall be attached in his hands, and after four defaults recorded on the part of the defendant, the garnishee shall find new surety to the plaintiff for the debt, and judgment shall be that the plaintiff shall have judgment against him, and he shall be quit against the other, after execution sued out by the plaintiff. By this custom, if a creditor discovers that a person within the city of London has any money or goods belonging to his debtor in his hands, he can attach the money or goods by proceeding in the mayor's court. He has to find sureties to restore the money or goods in the event of the defendant appearing within a year and a day and disproving the debt.

Each of the sheriffs of London has a court, which is held near Guildhall before a judge appointed by him, and which has jurisdiction over all personal actions arising in the city. These courts also have a general summary jurisdiction in personal actions, when the debt or damage claimed does not exceed 20*l.*, if any one of the defendants dwells or carries on his business in the city, or has dwelt or carried on his business there within six months before the action is commenced, or if the cause of action has arisen in London.

The Central Criminal Court is held at the Old Bailey. The lord mayor, the lord chancellor, all the judges of the courts at Westminster, the judge of the admiralty, the dean of the arches, the aldermen, the recorder, the common serjeant, the judge of the sheriffs' court or city commissioner, and any other persons whom the crown may appoint, are judges of this court. In it may be tried any crime committed in London or Middlesex, and in defined parts of the counties of Essex, Kent, and Surrey, surrounding the metropolis. It is held once a month, and two or three of the judges of the superior courts attend in rotation and preside at the trial of the graver charges. The other criminals are disposed of, in separate sittings, by the recorder, common serjeant, and city commissioner.

The London sessions are held eight times in the year before the lord mayor, aldermen, and recorder, or any four of them, and have jurisdiction over minor misdemeanors and poor-law appeals.

Of police courts there are two in the city of London, one held at the Mansion House, before the lord mayor, and the other at the Guildhall, before one of the aldermen; at these places criminals are examined on their first apprehension, to ascertain whether there is a sufficient charge against them to put them on their trial, and whether they ought to be imprisoned or admitted to bail, and minor offences and nuisances are dealt with in a summary way.

There are several small debts' courts, now named County Courts, in the metropolis: viz., the Whitechapel County Court of Middlesex, held at Osborn Street, Whitechapel; the Shoreditch County Court, No. 12, Charles Square, Hoxton; the Bow County Court, at Bow; the Clerkenwell County Court, at Duncan Terrace, City Road; the Bloomsbury County Court, at Portland Road, Regent's Park; the Brompton County Court, at Whitehead's Grove, Chelsea; the Marylebone County Court, at the New Road, opposite Lisson Grove; the Westminster County Court, at No. 83, St. Martin's Lane; the Southwark County Court, at Swan Street, Newington; and the Lambeth County Court, at Denmark Hill, Camberwell. These courts hold a summary jurisdiction over debts and demands not exceeding 20*l.*; actions which involve the title to land, tolls, fairs, markets, or franchises, or the validity or construction of a will or settlement, or malicious prosecution, libel, slander, criminal conversation, seduction, or breach of marriage promise, are excepted from their jurisdiction, and also from the small debts' jurisdiction of the sheriffs' court in London. They also have power to give possession of houses or lands where the tenancy has expired, if the rent or value does not exceed 50*l.* a year, unless by joint consent. Under an Act passed in 1850, the County Courts have concurrent jurisdiction with the superior courts in debts and demands not exceeding 50*l.* The *Daily News* gives on Monday a list of the causes before each County Court. The judges are barristers appointed by the crown. The Southwark sessions are held before the lord mayor, the aldermen who have passed the chair, and the recorder, four times a year. The Middlesex and other sessions are held for their respective jurisdictions before justices of the peace appointed by the crown, within Middlesex, Westminster, the Tower Hamlets, Kent, Essex, and Surrey, respectively. They transact the same description of business as the London sessions; all the more serious offences being tried at the Central Criminal Court.

There are eleven metropolitan police courts:—Bow Street Police Court, at Bow Street, Covent Garden; the Westminster Police Court, at Vincent Square; the Great Marlborough Street Police Court; the Clerkenwell Police Court, at Bagnigge Wells Road; the Worship Street Police Court; the Lambeth Police Court, at Kennington Lane; the Marylebone Police Court; the Southwark Police Court; the Thames Police Court, at Arbour Square, Stepney; the Greenwich Police Court; the Woolwich Police Court; the Hammersmith Police Court; and the Wandsworth Police Court. At Bow Street there are three magistrates; at each of the others, with the exception of the Greenwich, Woolwich, Hammersmith, and Wandsworth Police Courts, there are two; and at Greenwich and Woolwich there are two to the two courts; and so at Hammersmith and Wandsworth. These magistrates are appointed by the crown, and are selected from barristers. They have power not only to examine and commit offenders for trial or admit them to bail, if their offences are bailable, but also to punish summarily by fine and imprisonment many minor offences, such as assaults, obstructions of the public thoroughfares; also to order search for stolen goods, and to order the restoration of goods stolen or unlawfully obtained, to settle disputes as to the wages of bargemen and labourers who work on the Thames or the adjacent wharfs, to order compensation for wilful damage done by tenants, to grant relief on wrongful seizures for rent, if a house or lodging is held by week or month, or at a rent not exceeding 15*l.* a year, to order the restoration of goods not exceeding the value of 15*l.*, to order a house which is in a filthy and unwholesome state to be cleansed; to interfere in all complaints against cabmen, omnibus drivers, publicans, and policemen.

The police are a body of men appointed to preserve order and apprehend offenders. For the district surrounding the city of London, and over which the jurisdiction of the metropolitan police courts extend, they act under the direction and general superintendence of two commissioners appointed by the crown. Their number is fixed by the Secretary of State for the Home Department. The Commissioners of Police have power to suppress illegal fairs, unlicensed theatres, places used for fighting or baiting lions, bears, badgers, cocks, dogs, or other animals, gaming houses, to regulate the route and conduct of the drivers of carriages and cattle during the hours of Divine Service and public processions.

Each policeman is sworn to act as a constable for preserving the peace, and preventing robberies and other felonies, and apprehending offenders against the peace. By the general law of the land they may arrest, of their own authority and without warrant, any person who has been guilty of treason or felony, or whom they have good reason to suspect to be guilty of such crime, and carry him before a magistrate, to be examined and committed for trial; they may also arrest any persons they see fighting or committing an assault, and take them before a magistrate, in order that they may find surety to keep the peace. Their power to arrest such persons is not for the purpose of punishment, but for the preservation of the peace, and therefore they can only take them whilst they are fighting. They have no power to arrest after the quarrel is over. If a person has been guilty of a misdemeanor, or offence less than a felony, he must either be indicted, or a complaint should be made to a magistrate, and a warrant obtained under which he may be arrested.

A policeman may also arrest without warrant any person whom he sees committing certain specific acts of annoyance in a public thoroughfare. The following is a catalogue:—Exposing for sale, feeding, or foddering a horse, showing a caravan, shoeing a horse, breaking a horse, or repairing a carriage, to the annoyance of the inhabitants or passengers; turning loose a horse; suffering to be at large an unmuzzled ferocious dog; setting on a dog to attack, worry, or put in fear any person, horse, or animal; causing mischief to be done by cattle, by negligence or ill usage in driving; wantonly pelting, driving, or hunting cattle, by a person not employed to drive them; riding on any part of a cart, or on the horse drawing the same, without holding the reins by the person who has the care thereof, or if such person is at such a distance from the cart that he has not a complete control over the horse; riding or driving furiously, so as to endanger the life or limb of any person, or to the common danger of passengers; causing a cart, public carriage, sledge, truck, or barrow, to stand longer than necessary for taking up or setting down passengers; leading or driving a horse or carriage upon the footway; fastening a horse so that it stand across a footway; rolling or carrying a cask, tub, hoop or wheel, ladder, plank, showboard or placard, upon a footway; wilfully disregarding the orders of the Commissioners of Police regulating the route of carriages during

Divine Service, or for preventing obstructions during public processions; posting a bill against a wall, writing upon, defacing, or marking a wall, without the consent of the proprietor, or wilfully damaging any part of a building, wall, fence, or pale, or any fixture or appendage thereunto, or any tree, shrub, or seat in any public walk or garden; a prostitute or nightwalker loitering or being in any thoroughfare or public place for the purpose of prostitution or solicitation, to the annoyance of the inhabitants or passengers; selling, distributing, or exhibiting to public view any profane, indecent, or obscene book, paper, print, drawing, painting, or representation, or singing any profane, indecent, or obscene song or ballad, or writing or drawing any indecent or obscene word, figure, or representation, or using any profane, indecent, or obscene language, to the annoyance of the inhabitants; using any threatening, abusive, or insulting words or behaviour, with intent to provoke a breach of the peace, or whereby a breach of the peace may be occasioned; blowing a horn, or using a noisy instrument, for the purpose of calling persons together, or of announcing a show or entertainment, or of hawking, selling, or collecting any article, or obtaining money or alms; wantonly discharging a firearm, throwing a stone to the danger of any person, making a bonfire, or throwing or setting fire to a firework; wilfully and wantonly disturbing any inhabitant by pulling or ringing a door-bell, or knocking at a door without lawful excuse, or wilfully and unlawfully extinguishing the light of a lamp; flying a kite, or playing a game to the annoyance of the inhabitants or passengers, or making or using a slide upon ice or snow to the common danger of passengers.

Situations of the Metropolitan Police Stations, where information of Robberies, &c., may be given, and the assistance of Police Constables obtained when their services are required.

Letter of Division.	Local Name of Division.	POLICE STATIONS.
A	Whitehall.........	Great Scotland Yard, Whitehall; 2, Gardener's Lane, King Street, Westminster.
B	Westminster......	Rochester Row, Vincent Square; Robert's Buildings, Ebury Square, Pimlico.
C	St. James's	Little Vine Street, Piccadilly.
D	St. Mary-le-Bone.	Mary-le-Bone Lane; 5, Little Harcourt Street; Hermitage Street, Paddington.
E	Holborn	Clarke's Buildings, St. Giles's; Hunter Street, Brunswick Square.
F	Covent Garden...	34, Bow Street.
G	Finsbury..........	Bagnigge Wells Road, Clerkenwell; Featherstone Street, St. Luke's.

Situations of the Metropolitan Police Stations (continued).

Letter of Division.	Local Name of Division.	POLICE STATIONS.
H	Whitechapel......	Chapel Yard, Spital Square; Denmark Street, St. George's, East.
K	Stepney	*Middlesex.*—Mile End Road; Bromley, Devon's Lane; Wapping, Green Bank; Shadwell, King David's Lane; Stepney, Arbour Square; Poplar, Newby Place. *Essex.*—Plaistow; Great Ilford; Wanstead; Leytonstone Road; Woodford; Loughton; Dagenham; Barking; East Ham; West Ham; Chadwell Heath; Beacontree Heath.
L	Lambeth	Tower Street, Waterloo Road; Kennington Lane; High Street, near the Old Church; Christchurch, near the Old Church.
M	Southwark	Stone's End, Southwark; Paradise Street, Rotherhithe, near Mill Pond Bridge.
N	Islington	*Middlesex.*—Kingsland, High Street; Hackney, Church Street; Hoxton, Robert Street; Islington, Islington Green; Enfield Highway, Green Street; Stoke Newington, Lordship Road; Tottenham, near Scotland Green; Hornsey; Edmonton; Enfield. *Herts.*—Cheshunt. *Essex.*—Walthamstow; Waltham Abbey.
P	Camberwell	*Surrey.*—Walworth, Park House, Lock's Fields; Camberwell Green; Brixton Road; Mitcham; Croydon, George Street; Streatham; Thornton Heath; Sutton; Addington; Carshalton.
R	Greenwich	*Kent.*—Greenwich, Blackheath Road; Woolwich, William Street; Lea Road; Lewisham, Rushey Green; Sidcup; Bexley Heath; Bromley; Farnborough; Beckenham; Shooter's Hill; H. M. Dock Yard, Deptford; H. M. Victualling Yard, Deptford; H. M. Dock Yard, Woolwich; H. M. Royal Arsenal, Woolwich.
S	Hampstead	*Middlesex.*—Highgate, High Street; Willesden, Stone Bridge; Edgeware Road, 8 mile stone; Regent's Park, 52, Albany Street; Kentish Town, Junction Place; Hampstead, 1, Heath Street; Somers Town, Phœnix Street; St. John's Wood, 52, Salisbury Street, Portman Market; Chipping Barnet, High Street; Bushey, High Street; South Mimms; Hendon; Finchley.
T	Kensington	*Middlesex.*—Kensington, Church Court; Hammersmith, Brook Green; Brentford; Hanwell; Hillingdon and Uxbridge; Hounslow; Staines; Harrow; Ealing; Acton; Harefield; Harlington; Stanwell.
V	Wandsworth	*Middlesex.*—Hampton; Sunbury; Chelsea, Milman's Row. *Surrey.*—Kingston, London Road; Epsom; Wandsworth; The Plain; Clapham Common; Richmond, Prince's Street; Mortlake, High Street; Lower Tooting, Salvador; Merton; Barnes, Priest Bridge.
T D	River Thames ...	Blackwall; the Ship "Investigator," lying off Strand Lane, Wapping.

In the city the police are under the control of a commissioner, appointed by the common council, with the approval of the crown; and the number of constables is fixed by the mayor, aldermen, and common council. They have the same powers in the city as the metropolitan police have within their district. The fire police are noticed under the head of Insurance.

Situations of the City Police Stations.

First district	Moor Lane.
Second district	Smithfield.
Third district	119, Fleet Street.
Fourth district	Garlick Lane.
Fifth district	57, Fenchurch Street.
Sixth district	Bishopsgate Street.

Chief office, 26, Old Jewry.

Public-houses, that is, places in which wines and spirits are sold by retail, and the keepers of them, are licensed annually by the justices of the peace of the district in which they are situate. The same authority grants licences to places for the public amusements of music and dancing. Beer may be sold by retail under a licence granted by the Commissioners of Excise, and in this respect there is a distinction, some beersellers being licensed to sell beer to be drunk on the premises, and others licensed to sell beer which must not be drunk on the premises. To obtain the first the applicant must pay the tax for the licence, and obtain a certificate of good character, signed by six rated inhabitants of the parish, and certified by one of the overseers. To obtain the other he has only to pay the tax.

Omnibuses, hackney-coaches, and cabs, are under the control of the commissioners of police, who grant licences and tickets to omnibuses, hackney-coaches, cabs, their drivers and conductors, and the attendants at the cab-stands, called watermen. Every carriage and man has a number, which it is compulsory to exhibit conspicuously.

The number of omnibuses running daily is said to be 3000, employing 30,000 horses. It is reckoned they carry persons to the extent of 300,000,000 of times.

The buildings of London and its vicinity are under the supervision of three architects, called Official Referees, and others called District Surveyors. No new building, or party wall, can be erected without informing the district surveyor, who superintends the building, and sees that the walls are of proper thickness and construction. He is also bound to report buildings which are ruinous and dangerous to passengers, and the mayor and aldermen in London, and the overseers of the parish elsewhere, may pull it down if the owner neglects to do so.

The sewers in London are kept in order by commissioners of sewers, appointed by the corporation. Those in the surrounding districts by commissioners of sewers, empowered by a commission from the crown. The powers and duties of each set of commissioners are defined by acts of parliament. They have authority to compel the proper drainage of houses.

The commissioners of sewers in London repair the streets. In the other parts of the metropolis this is done by commissioners, or surveyors, chosen by the parishioners.

As there is no municipal authority for the whole metropolis, or the several portions of it, except the city of London, the functions elsewhere exercised by the inhabitants or their representatives are mostly usurped by boards of commissioners appointed by the government. Thus the police is under the commissioners of police; sewers, under the commissioners of sewers; sanitary arrangements and cemeteries, under the board of health; turnpike roads, under the commissioners of roads; public buildings and improvements, under the board of works.

The poor law, and management of the paving, cleansing, and lighting, are still in the hands of the inhabitants of the parishes, or unions of parishes, or districts of them, and their representatives. The most important of these assemblies are the vestries of Marylebone and St. Pancras, which have among their members peers and members of parliament.

Postal Regulations.—The postal arrangements of London have been so extensively imitated, that they present no difference from those of other capitals, except in their vastness. The centre is the General Post Office, in St. Martin's-le-Grand, Cheapside, seated on an ancient collegiate establishment, once a sanctuary for murderers and thieves. The branch offices, on a smaller scale, are Lombard Street (the old general post-office) for the city, Charing Cross, Old Cavendish Street, and Blackman Street, Southwark. In each of the principal thoroughfares, and in every district at convenient distances, receiving houses are kept by shopkeepers. Their situation is indicated by an inscription attached to the nearest gas-lamp.

For the metropolitan purposes of the Post Office, London consists of two districts—a circle of three miles around the General Post Office, and all beyond the three-mile circle, which latter is suburban, and has fewer and later deliveries of letters.

The receiving houses may be considered as complete for all purposes of the visitor as the General Post Office. They all sell postage stamps of 1*d*., 2*d*., 6*d*., 8*d*., and 1*s*., for the prepayment of letters, and they take charge of all letters and newspapers for every part of the world. Only certain district receiving houses grant and pay money orders for the remittance of money to any part of the islands. The post-offices do not, as abroad, receive subscriptions for newspapers; that is the business of the newsvender. The receiving houses close earlier than the branch post-offices, and these earlier than the General Post Office; so that in case of any delay, or the necessity of posting a letter late, the General Post Office is the last resource.

The minute and recent details of post-office regulations cannot here be given; for those we must refer to the Post-Office London Directory, which is a complete guide to the individualities of the world of London, and which should always be resorted to by the stranger for any information. It is to be found in every place of public resort.

Letters, if properly prepaid with stamps, can (with the exception of some few foreign places) be dropped into the box of the receiving houses without trouble or inquiry. When once in, the postmaster has no power to deliver them back again on any plea or pretence, as they are under charge of the establishment for delivery to the address. If the letter contains articles of value (not provided for by a money order), it may be registered, when a fee of sixpence is charged, and a receipt is given for it. The address on a letter should be distinct and legible, and with the post-town clearly marked. The stamp is pasted on the right-hand upper corner, for the convenience of obliteration in the Post Office. To save trouble in making up letters, stamped envelopes can be bought at the receiving houses, and which require no wax or wafers, as they have an adhesive seal.

As, notwithstanding all the care of the establishment, robberies of letters containing valuables are occasionally committed by its employees, it is recommended always to register such letters; but it is far preferable to send a money order, which is only payable to the person in whose name it is given, and who can be identified by the local postmaster. This order, if stolen, is of no good to the thief. There is a money-order office in every market town. Very small amounts may be remitted in postage stamps.

Persons should be very particular as to the weight of their letters, as the receiving houses are not supplied with weighing apparatus by the government, and even when weighed by them, the letter is sometimes found overweight in the General Post Office, and double postage becomes payable by the receiver of the letter. The English scale begins with half an ounce, for which the charge is one penny, and then goes on by ounces, for each of which two-pence is charged. The scale for foreign letters is sometimes a quarter of an ounce. The half ounce will take within an envelope a sheet and a half of quarto-post paper, or three sheets of note paper.

In writing a letter, the full address of the sender should be carefully written within it, for the information of his correspondent, and of the dead-letter office, in case of need.

Newspapers, that is, stamped publications, go post free all over these islands, most of the colonies, the United States, France, and many countries of Europe. In some cases of foreign dispatch they must be prepaid. Many periodicals publish a stamped edition for transmission by post. Newspapers sent within the three-mile circle are charged one penny. The address, but nothing else, may be written on the newspaper, or on an envelope open at both ends. Any communication written on a newspaper is charged with heavy postage. Care should be taken the newspaper is well secured, as it may burst open in the Post Office, and the address be lost. Newspapers may be sent at any time, except for foreign dispatch, when it must be within seven days of publication.

Parliamentary reports and documents, and those of the colonial legislatures, may be sent of any weight, and at lower rates of charge. Pamphlets and books may be sent at low rates of charge. All these must be left open, and be without writing on them, other than the address.

Small parcels are taken by the Post Office at reduced rates, but it is not wise to send articles which may break, or which stain, as the Post Office will detain them.

Prices current, and commercial and shipping lists, are sent at reduced rates, although not stamped as newspapers.

Letters sent unstamped or unpaid cause double postage to be levied.

Persons coming to reside in London should take care to communicate their address precisely to their correspondents, including the number of the house. It should be borne in mind many streets in London have the same name, as King Street, Queen Street, and so forth. If a money order is to be sent, the name of the nearest money order receiving house should be communicated. Strangers, when settled down, can communicate their address to the General Post Office, which will assist in forwarding any ill-directed letters.

In case of any overcharge or other mistake, the envelope should be kept and produced at the General Post Office. Applications for letters missing should be made to the Dead-Letter Office, General Post Office.

Persons should be careful to send to their correspondents and the Post Office any change of address, as it is not safe to trust to the chance of letters being redirected and forwarded, and such letters are charged one penny.

On the delivery of a registered letter the receiver must sign a receipt tendered by the letter carrier.

Foreign and ship letters for persons whose residences are not known are announced in a list hung up daily in the hall of the General Post Office. Persons writing their addresses opposite to their names will receive their letters on the following morning.

The impressions on the letters are a peculiar shape (according to the country) and number (assigned to each local post-office) for obliterating the stamp, an impression, with the date of postage and the name of the post town, and a circular mark of the General Post Office, in red ink, with the word "paid," and the date of delivery. If unpaid the circular mark is on the back in black or red ink. These marks serve to show whether there has been any delay in posting a letter, and should be examined in case of doubt or dispute.

It is most desirable a letter carrier should not, on any account, be kept waiting when delivering a letter, as thereby the whole delivery is delayed, and if this were to be done extensively the personal inconvenience would become very great. If a foreign or other unpaid letter is expected, change for payment should be given to the servant beforehand, so as to prevent the postman from being delayed.

For the conveyance of parcels within the metropolis there is a joint-stock establishment, called the Parcels' Delivery Company, which has receiving houses in every district.

Country parcels must be sent to the offices of the great carriers at the railway stations; the Swan with Two Necks, Gresham Street; Bull and Mouth, St. Martin's-le-Grand; Spread Eagle, Gracechurch Street; Golden Cross, Charing Cross; George and Blue Boar, Holborn; Saracen's Head, Skinner Street, Snow Hill; Cross Keys, Wood Street; Spread Eagle, Regent Circus; Green Man and Still, Oxford Street; Peacock, Islington; White-Horse Cellar, Piccadilly; White Horse, Fetter Lane; Bolt-in-Tun, Fleet Street; and Belle Sauvage, Ludgate Hill, &c.

Full information, as to sending parcels and luggage, is contained in the Post-Office Directory, under the head of Conveyance Directory.

BANKING—*Bank of England.*—Banking, after the expulsion of the Jews and the decline of the Lombards, was carried on in London by the goldsmiths as a part of their business during the seventeenth century, but by the beginning of the last century it had become a distinct business. Its chief seat has been for hundreds of years in Lombard Street, and the settlement of the great medieval money-lenders is further commemorated by the arms of Lombardy being still the ensigns of the pawnbrokers in the form of three golden bezants or balls.

The issue of paper-money in London is now restricted to the Bank of England, though formerly goldsmith's notes circulated. Some of the banks, however, issue for the Continent circular letters of credit, and many of the bankers carry on a large business as agents in London for the country banks, issuing paper-money.

The ordinary banking business of taking care of money and lending it out is carried on by the Bank of England, the private bankers, and the joint-stock banks. Elsewhere in this island, as in many countries, banking is in the hands of joint-stock companies, but until a late date the Bank of England was allowed a monopoly in London against the establishment of any banking company, and thereby virtually a monopoly was given to private banking. The private bankers still have the chief business, and nowhere else in the world will be found so many and such powerful firms, some of which date from the 17th century, and were sufferers by the confiscation of their property in what was called the closing of the exchequer in the Tower by Charles II. Stone, Martin, and Stone claim to be the successors of Sir Thomas Gresham, the great capitalist of Elizabeth's day. Child's dates from 1663, Hoare's from 1680, and Snow's from 1685. Ten others (Coutts', Glyn's, Drummond's, Barclay's, Fuller's, Gosling's, Hankey's, Robarts', Smith's, and Willis's) were in existence before 1765. These bankers of London have given members to the peers, and have always had many members in the other House, but a characteristic not least honourable is their large contributions to the charities of the metropolis. The banks are distributed into three classes, the City, the West End, and the Smithfield banks. The City banks carry on all the business of banking, are agents for the country banks, and discount bills; the West End are chiefly limited to the deposit of money; and the Smithfield banks carry on the transactions of the farmers, cattle dealers and butchers on market day.

It may be said that the great end of London banking is to economise coin by using it as little as possible. Cheques or drafts on the banks are given in payment, and here is brought into play a most interesting and it may be said, a wonderful institution in the shape of the Clearing House. This is an office in Lombard Street, belonging to private banks, and from which they exclude the joint-stock banks. To evade the operations of the stamp duties a cheque is always drawn to A. B. " or bearer," whereby a hazard is incurred, as if stolen or picked up " the bearer," whoever he may be, can demand payment. The ingenuity of the trader here steps in to baffle the government. As most traders have bankers, and thieves have not, a cheque is what is called "crossed" that is to say, the name of the banker of the payee is written "a-cross" it, or if this is not known two lines are drawn across it with the words "& Co.," leaving the payee to fill in a banker's name. Thus the cheque must be presented through a banker. Now, suppose that a cheque on Smith, Payne and Co., is given to a customer of Robarts, Curtis and Co., these latter do not send to Smith's house and get money for it, but they send it to the clearing house. There each banker has a desk, and at fixed times in the day he sends in to each of the other bankers a list of all cheques payable, receiving a like list in return. Thus Smith's and Robarts' have only to settle the balance of their respective lists, but even here the matter does not rest, for, although Robarts' may be indebted on the balance to Smith's, yet as Robarts' may have more than the balance owing from (say) Attwood's a general clearing takes place through the superintendent of the clearing house, and the final settlement of a day's transactions to the amount of millions is commonly effected by the payment in cash of a few pounds, and of a bundle of notes. The day's transactions often amount to 5,000,000*l.*, and 3½ per cent. is the average amount of bank notes used. The banker is thus able to keep a smaller stock of bank notes, that is a smaller balance, and thereby to gain interest. Many of the brokers and mercantile firms likewise benefit, who have on particular days to pay and receive large amounts in checks, as both payments and receipts meet at the same time, and the balance, which was in their banker's hands on the night before, remains undisturbed.

The practice of clearing is said to be above a century old; the bankers employing clerks, named "clearers," who used to settle their accounts on the top of a post, or upon one another's backs in Lombard Street, and very often resorted to one banking house which had a large recess in the window, which they found very convenient; but the house in question found just the opposite, and their noise made such a hindrance to business that, as it is said, they were often summarily turned out. This led to a house being taken in 1810, and the organization of a system admirable in its simple arrangements, and which has since been adopted by the railway companies. Printed forms are used throughout, those of debtors being in red, and those of creditors in black.

By the rapid passage of cheques the labour of the banker is economised, but by the system of bill broking his balances are pared down. The customer keeps with the banker such a steady balance as is considered to be enough to remunerate him for the trouble of keeping the account, but moneys beyond this balance are lent at short dates on the Stock Exchange, or to bill brokers. The Stock Exchange is greatly fed by these loans, which are made from fixed period to fixed period called "account days," on the deposit of English or foreign stock, bonds, or shares. At the "account day" the money may either be drawn in or "continued" till the next "account day." These "account days," which are likewise the times for settling other transactions on the Stock Exchange, give a great deal of work to the clearing house, and, without the latter establishment, could with difficulty be got through. Those who want their money lent out for a long fixed date, or a very short date as a few days, or an uncertain time, that is upon demand or "call," deposit it with a bill broker, who gives them a parcel of first-rate bills. Bill broking, in which the great house of Gurney in Lombard Street have the pre-eminence, it will be seen is only a variety of banking. The West End bankers and country bankers, as well as private individuals, invest their spare funds with the bill broker, to whom the first-class merchant applies for discount, and it is the bill broker who regulates the rate of interest for the whole mercantile world. Although the Bank of England publishes from time to time a notice of the rate at which it lends money at interest, yet this rate is higher than that of the bill broker for first-class bills, and is regulated by the competition of the bill broker. As the banks in the agricultural districts send to the bill broker to deposit money for which they have little demand, so the banks in the manufacturing districts send to him bills. These are "rediscounted" at a lower rate than that charged to the manfacturer, and thereby the country banks make a profit.

Besides the clearing house which they have in common, the bankers employ a solicitor and detective police for the prosecution of those who embezzle from them or forge upon them.

Many of the private bankers are connected with brewing firms, and through them banking is extended to the lower classes. The publicans are the treasurers of many of the mechanics, and from the publican the brewer's clerk collects whatever moneys he has in hand, and pays it in to the bankers. By this means the hoarding of money in London is very much limited.

A peculiar feature of a London bank is the "strong room," that is a fire-proof vault well secured, in which the property of the customers can be kept. Here, at the West End bankers, are the plate chests of the prince piled up during absence from town or until wanted for a great banquet, but the "strong-room" of a city bank is a scene of business. Not only are there the chests of deeds and securities belonging to the great capitalist, but the stock-in-trade of the smaller capitalist. Each morning a number of members of the Stock Exchange and of Lloyd's pour into the city to pursue their avocations. They have neither office nor clerk, and yet they carry on large transactions. At the beginning of business the small tin-box with cash and securities is carried off to the scene of business and again carefully returned in the evening, while the papers and books are locked up in a small drawer, which is rented.

Any one can set up a private bank without capital if he can get any one to trust him, but the joint-stock bank affords the guarantee of a large paid-up capital and of a list of shareholders who are further responsible to the full extent of their fortunes for any loss sustained by their customers. The joint-stock banks have only been established in consequence of the alteration of the law within the last twenty years, but they are constantly advancing. Whereas the private banks pay no interest on deposits, several of the joint-stock banks do allow a small interest. There is little that is peculiar in the joint-stock banks apart from their organization. They have large and fine buildings, and a staff of well-trained officers. The exertions of Mr. Gilbart and of the late Mr. Jopling, the founders of the joint-stock bank system, have been the means of promoting the technical study of banking and the sciences connected with it, and of maintaining a useful periodical called the Banker's Magazine, besides occasionally supporting other periodicals, and forming a banking literature. The London and Westminster is a good example of a joint-stock bank. Most of the joint-stock banks have branches in several parts of the metropolis.

The Irish and colonial joint-stock banks have their head offices in London, but the latter are not allowed by their charters to carry on independent business here. These establishments absorb a large amount of capital, and the shareholders are commonly protected by charter against further liability.

There are very large establishments, which elsewhere are understood as banks, which here stand in an anomalous character. A stranger thinks of Messrs. Rothschild as among the first bankers, a Londoner never thinks of them as such. The Messrs. Rothschild have their great establishment in a large building in St. Swithin's Lane. Here they pay the dividends of the several foreign loans for which they are contractors, and carry on their business in the remittance of money to the continent. The Messrs. Baring carry on a like business for the New World, though they likewise carry on more extensive mercantile transactions. Messrs. Ricardo (Spanish); Bischoffsheim and Goldschmidt; and King (Brazilian) are among the other agents of foreign states. The Portuguese and Mexican governments have offices of their own, called Financial Agencies, for the transaction of their business. Many of the greatest capitalists, whose reputation is universal and whose names are to be found to whole loans, as the Baron de Goldsmid, Mr. John Attwood, and Sir Moses Montefiore, have no offices.

The savings banks receive the savings of the small tradesmen and middle classes, and these institutions have a greater development in London than in any part of the country. The difference between the government rate of interest and that allowed to the depositors affords liberal salaries to the actuaries and the clerks, and as the banks are few, and the deposits large, they have generally good buildings. The London Provident Institution, Bloomfield Street, Moorfields, is a very good example of these establishments. There are about thirty of these banks in London, with 4,000,000*l.* of deposits. Considerable business is likewise done by them in the sale of government annuities. A penny bank was established in 1849 for the deposit of still smaller savings.

The banks in London do not provide accommodation for the small shopkeepers, any more than they do for the working classes; hence not only savings banks, but loan societies and pawnbroking, are found in the metropolis, carrying on operations on a great scale. Loan societies are, of late years, regulated by an act of parliament. They are commonly formed by small tradesmen, and held in public houses, and lend sums of from 1*l.* upwards, on the security of two or more persons besides the borrower, receiving back the advance in weekly or monthly instalments. They make a charge for the book of conditions, and for inquiries into the character of borrower and securities. In 1846 thirty-nine loan societies were returned to parliament, which granted 11,860 loans; but these are only a small part of the whole. There are a few charities which lend money without interest, or on low terms, but in a town so great it is found the fraudulent reap more benefit from such institutions than the deserving.

Pawnbroking is not authorized to be carried on by large bodies, and therefore it is a private trade, there being no large *Monte de Piété.* The pawnbrokers pay a yearly stamp duty for a licence, and their rates of interest are regulated by act of parliament. Among the very poorest classes the pawnbroker is competed with by the dolly-shopkeeper, who, under a sham sale, lends a few pence, giving back the articles at a higher price. There are no statistics of this trade.

The tallyman sells goods of all kinds to the working classes, at their own houses, sending an agent weekly to receive payment by instalments, which constitute a large price. Although legitimate accommodation is afforded by the tally system, yet in most cases the means of the working classes are absorbed by the tallyman, the pawnbroker, and the publican. A new dress or piece of furniture is bought of the tallyman; before it is fully paid for it is pledged to the pawnbroker, and another account opened with the tallyman.

The Bank of England, in Threadneedle Street, is the great monetary institution of the country. Like so many other establishments in England, although performing public functions, it is not under government control. The scheme for it was projected by Mr. Wm. Paterson, and in 1694 William III. granted a charter. From that time it has been in operation as the government bank, and has at length acquired a monopoly, now spreading over the country, of the issue of paper money in the metropolis. The whole capital, originally 1,200,000*l.*, and now 14,553,000*l.*, has been lent to the government, and is in their hands. The charter is always granted by parliament for a short term only as a lease liable to be resumed, or given with new conditions, as the last time in 1844. Although the private banking transactions are on a large scale, yet they are subsidiary to the others' transactions, and the bankers and brokers successfully compete. The Bank, at times, discounts largely, but its own exigencies and those of the government have often prevented it from doing justice to commercial interests. The rate of interest first charged was from 4½ to 6 per cent.; but this was reduced, and has seldom gone beyond 5 per cent., except in August, 1847, when it was, for a short time, raised to 7 per cent. The Bank, from time to time, gives notice of the rates and dates at which it will lend money on funded securities and on bills, but it no longer regulates the money market. The Bank has been more than once in difficulties, as in war time the government drains the bullion from it, and in times of bad harvest bullion goes abroad to pay for the sudden import of foreign corn. In 1696, it suspended payments of its notes, which were quoted at 14 discount; in 1797, the government, by the Bank Restriction Act, forbade it from paying its notes in gold, and this restriction was kept on until 1819 (Peel's Bill); in 1826, the government authorized it to issue temporarily 1*l.* notes to meet the panic; and in 1847, to exceed its issues, but this authority was not acted upon. The notes of the Bank were originally for large, and sometimes irregular amounts, paid by instalments; but in 1759 the limit, which had been 20*l.*, was brought down to 10*l.*, and in 1793 to 5*l.* From 1797 one-pound notes were constantly issued till Peel's Bill. Since that time the lowest notes are for 5*l.* From the issue of notes, allowances for paying the interest on the national debt, profits on bullion, and ordinary banking sources, the Bank derives its income. In 1695, the dividend was 9 per cent.; but this, in the last century, was seldom more than 5 per cent.; but from the time of the French war it has risen, and is now kept at 7 per cent., with occasional bonuses. To uphold this dividend the Bank has always a large reserve called the Rest. The stockholders choose the court, which consists of a governor, deputy-governor, and twenty-four directors, the governor holding 4000*l.* stock, the deputy-governor 3000*l.*, and the directors 2000*l.* Until very lately the direction had fallen into much disrepute, for private bankers being held ineligible, and great capitalists not caring for the trouble and responsibility, it was filled up by a clique of jobbers, who recommended a house list of candidates. These men had profited by the political and other circumstances during the war, to raise themselves prominently into notice, living at a high rate, and, as it turned out, living upon the public. They were called "lives and fortunes' men," because to uphold the Pitt administration they had got up a memorial pledging their lives and fortunes in its support, their fortunes being then very problematical, and a subject of derision to men of substance. This clique was severely shaken in 1825; but of late years the failures of governors and deputy-governors, paying only half-a-crown in the pound, became so numerous as to induce the holders of Bank Stock to purge the direction. This court of directors assembles in the Bank Parlour, and has the undisturbed management of the affairs of the corporation, as it is a rule with the proprietors in their quarterly courts not to discuss any details of the business. The governor and the deputy-governor carry on the negotiations with the First Lord of the Treasury, or the Chancellor of the Exchequer. The court receive about 8000*l.* yearly, and have under them a staff of a thousand officers, clerks, porters, and messengers. The establishment is liberally remunerated, with a regular system of promotion, a superannuation fund, guarantee fund, and library, so that the appointment of a bank clerk, if not brilliant, is solid. In war time a battalion of volunteers was formed from the establishment, and armed from the armoury within the walls, and in times of civil commotion the staff is liable to be called on for the defence of the Bank. In the daytime there is no guard, but every evening an officer and party of soldiers is marched in from the garrison of the Tower for the night service. The transactions of the Bank are now chiefly regulated by the last charter act (Sir Robert Peel's, 7 and 8 Victoria, chapter 32). This provides that the note issuing and banking functions of the Bank shall be divided. The Bank is allowed to issue notes, first upon the security of the government debt, that is, 14,500,000*l.*, and further, upon any amount of bullion in its vaults; the circulation, therefore, rises and falls with the quantity of bullion in the Bank. This circulation has now fallen as low as 20,000,000*l.*, while the amount of bullion in the Bank has nearly reached 17,000,000*l.*, but the bullion has of late years fluctuated below 5,000,000*l.* In the offices gold is given for notes and notes for gold. On presenting a note in the cashier's office the name and address must be written on the top; it is then examined by one clerk and is paid by another. The business of the Bank being large the forms are more complicated than in smaller establishments. The banking consists first of the payment of the interest on 700,000,000*l.* of the national debt, for which it is allowed a small sum, but virtually the government business is done in consideration of the monopoly of the note circulation. Here registers are kept of the sales and purchase of stock, of the names of the holders, and the half-yearly dividends are paid to those who, in popular phrase, put their money in the Bank. The offices for this purpose take up a large space in the Bank. The Bank likewise advances money to the government on exchequer bills, or treasury bills, or bonds, in anticipation of the receipts of taxes, or to meet any sudden demands. By making advances to capitalists on stock and exchequer bills it keeps up the value of the public funds as a security. The Bank receives and pays money for all the public departments, and the public balance is sometimes large before the time for paying the dividends. It keeps accounts for private individuals, including all the London bankers, and the balances are large after the time for paying the dividends, as they are then transferred from the public account to the private. Its advances on securities and bills fluctuate like the balances, in various proportions of 25,000,000*l.* The amount of coin kept in the banking department is very small, as the reserve is kept in notes.

On the Bank is virtually reposed the responsibility of keeping up the chief stock of bullion in the country, and this it effects by large purchases of bullion. Most of the bullion from California, Peru, Mexico, Brazil, and Russia, is at once carried to the Bank vaults, and the Bank makes advances on it, or buys it. If needful it is sent to the Mint to be coined, the Mint not taking any charge or seniorage. The transactions in bullion leave the Bank a profit.

The Bank has branches at Liverpool, Manchester, Newcastle, Leeds, Hull, Birmingham, Leicester, Swansea, Bristol, Plymouth, and Norwich.

The Bank business was first carried on at Grocers' Hall, but in 1732 the present building was begun, and it has been since extended to embrace the greater part of the parish of St. Christopher de-Stocks, the churchyard of which forms an inner court. The ancient stream of Walbrook runs under it, and the foundation is there carried on piles and counter arches.

The business of Assurance is the means in London of maintaining several large corporations, the buildings for which are among the architectural ornaments of the metropolis.

Life assurance was one of the first branches which flourished, and it received its great development as a convenient means of gambling. Lives were picked out, on which both parties could speculate, the one on the prospect of their duration, the other on that of their early falling in. Private assurance offices flourished in the seventeenth century, as betting offices do now; and at length legislation was directed to the suppression of the evil, but, as most commonly happens, to the punishment of legitimate business likewise. It is in this legislation we find the cause of the present trammels on life assurance. In 1698, a fund was formed in Mercers' Hall for granting annuities to clergymen's widows; but this fell to the ground. In 1706, the Amicable Society was incorporated by Queen Anne for life assurance, and still exists. The arrangements of this corporation are peculiar and antiquated. In the last century and the present many assurance companies have been formed, and now a great number exist, conducting their business so as to offer various advantages. Those which are proprietary offer the guarantee of a paid-up capital, and can conduct some classes of business on low terms. Those which are mutual divide among the assurers the whole profits, and therefore secure to them the full value of their contributions. The Equitable is the most remarkable of these latter, and is one of the most wealthy corporations of the world, having millions accumulated and invested. Every seven years an apportionment is made among the assurers of the accumulations. Some companies unite partially the proprietary and mutual principles; some, which offer a commission for the introduction of business, enlist the co-operation of particular professions, in some cases by contributing to a professional charitable fund. There are companies for lawyers, medical men, architects and builders, officers, licensed victuallers, farmers, churchmen, dissenters, Roman catholics, freemasons, and temperance men. These companies undertake the granting of sums of money at death, or of annuities during life. They purchase reversions. Many carry on a lucrative business by lending money on security, taking a life policy as the bonus for the transaction. Large sums are yearly accumulated by these companies, which have now become the great money-lenders, and besides their investments in the funds, they are large holders of railway debentures, and extensive mortgagees of the estates of our great aristocracy, particularly in Ireland. They share, with the Bank of England, in loans to corporations and public bodies, and all large money transactions.

Within the last two or three years companies have been formed for the special risks of sudden death and railway accidents, calculating rather upon the public alarm than upon the extent of the risk.

The benefit societies are the assurance companies of the working classes, and are protected from litigation by special enactments. There are assurance companies formed to profit by the privileges thus conferred. Most of the benefit societies are unfortunately not enrolled under the act, and there is, therefore, no security for their administration, while it very seldom happens that the scale of contributions is high enough to secure the permanency of the fund. The Odd-fellows, and other pseudo-secret societies, which are the favourites of the working classes, are unenrolled, and dissipate part of the contributions in public-house dissipation and in mummery. The burial and sick clubs, which are enrolled, generally succumb under the publican, the undertaker, and the trade politician, who, as secretary or treasurer, embezzles the funds.

In connection with the assurance companies a distinct profession has been formed of actuaries, or those employed in the scientific calculations of the risks, and they have an institute of actuaries.

Fire assurance, it might have been thought, would have been early provided for, and that it would be met by a common fund, as elsewhere; but it was not till the beginning of the last century that it was fully organized, and then as a business carried on by great corporations. The Royal Exchange Assurance was incorporated in 1720, and likewise takes life and sea risks. The business of fire assurance is burthened with a very heavy stamp-duty, for whereas the charge for a single risk is 1*s.*, or 1*s.* 6*d.* per cent., the duty is 3*s.* per cent., constituting a tax on those of provident habits. Farming stock, of late years, has been exempted from duty. The business is carried on chiefly by a few large London corporations, and by provincial district corporations, such as the Norwich Union. As it requires a large business to support a fire assurance company, it is seldom a new one succeeds. The pawnbrokers have a company of their own, on account of the companies charging them high rates. In London the fire insurance companies long since maintained their own engines, as the parish engines were found insufficient in repressing fires. A few years ago it was proposed to amalgamate the establishments of the assurance companies, and a fire-brigade was formed, which, anomalous as it may appear, is supported by the companies, and therefore at the charge of the assurers. The fire-escapes are maintained by voluntary contributions to the Royal Society for the Protection of Life from Fire. The fire-brigade has stations throughout London, and on the Thames, where engines, staff, and appliances are kept in constant readiness, and attend fires on summons from the police. Sometimes the engines are summoned by electric telegraph, and conveyed by railway to fires in the country. Each parish has likewise its engines, which are less powerful. To assist the firemen in getting at the water, tablets will be noticed on the fronts of the houses (as W. M. 16 feet), showing where the water-taps are. Persons working at the engines are paid on the spot by the superintendents of the brigade, though volunteers enough can be got. On a fire being discovered, the policeman springs his rattle, and runs off to the fire-brigade station; other policemen being warned, the inhabitants are awakened, the fire-escape and turncock are sent for, a party of police assembles for the protection of the property and keeping order, and on the arrival of a horse-engine the main has been opened, and proceedings commence for putting out the fire—the force receiving constant accessions from every engine-station, according to the emergency. London not being a garrison, the military seldom attend a fire, unless in the immediate neighbourhood of a barrack, or when some great establishment is in flames. A fire is a lamentable spectacle; but to a foreigner a fire in London gives a good opportunity for studying the national character, and the independent spirit of discipline and organization which distinguishes the population. There is neither a military force present, nor a magistrate high in power to direct the operations. The police and firemen have no command but their own moral influence; they are only members of the working classes; but an energy, activity, and regularity are displayed, and a readiness of co-operation on the part of all classes, which overcome successfully the difficulties to be encountered. The scene after a fire is likewise worthy of notice. No military force is drawn up in the neighbouring streets to preserve order, but two or three policemen are left to keep open a thoroughfare through the inquisitive crowd. Abroad discipline is sought in arms, and in the power of the government; here in the bosoms of the citizens, by enlisting their willing co-operation, and by complying with the direction given by their action.

Among agricultural risks provision is made for insuring the lives of cattle, and insuring stock against hail. Hail does not commit such ravages here as in the wine countries; and cattle and sheep being held in large lots, so as to give an average, these branches of assurance have not the same extension here as elsewhere.

Marine assurance is a great business in London; but its administration differs from the other branches, as, except what is done by the corporations, the business lies in the hands of private parties; that is to say, the underwriters, who make their place of assembly at Lloyd's. The voluntary association of these underwriters in a private coffee-house has resulted in a vast organization. They keep up not only records of shipping news, accessible to their members, but a register of all shipping, English and Foreign, to be assured by them, and which is known as Lloyd's Register. At every port throughout the world is an agent of Lloyd's to give information of shipping movements, and to take charge of wrecks. Every day a paper is published of shipping movements, called Lloyd's List. At Trieste a great trading corporation, and a newspaper, are named after Lloyd's. The business of marine assurance is much restricted in England by heavy duties on policies, so that no business is done in England for foreign assurers, as with life and fire, but many English ships are assured at Hamburgh, and other foreign ports, where there are no duties. Many of the colliers arriving in the port of London are mutually insured in clubs belonging to their respective ports.

Lloyd's Register of British and Foreign Shipping is at 2, White Lion Court, Cornhill, and is an office of considerable importance, peculiarly so to the shipping interest of the United Kingdom.

Previous to the year 1834, there were two register books printed; when this society was formed for obtaining a true and accurate classification of the mercantile marine of the kingdom and of the foreign vessels trading thereto.

The affairs of the society are under the direction of a committee in London of twenty-four members, consisting of merchants, shipowners, and underwriters. The chairman for managing the affairs at Lloyd's, and the chairman of the General Ship Owners Society, and also the chairman and deputy-chairman of the Liverpool Committee, and the chairman of the Rotation Commissioners for the time being are *ex-officio* members of the committee. A proportion of the members retire annually, and the vacancies are filled up by the committee for managing the affairs of Lloyd's, and by the committee of the General Ship Owners Society.

The surveyors are appointed by the committee and one or more so appointed are stationed in every seaport of the United Kingdom. The reports of the surveyors made, and all documents relating to the classification of the ships are carefully preserved, and the classification is made by a sub-committee who examine into the reports, and if the several rules established by them for the building and repairing of the ships have been conformed to.

The lists, showing the class each ship belongs to, as A 1, Æ 1, &c, are published every year, and corrected from time to time as the necessity for so doing appears.

The high repute the committee and their affairs have attained for their integrity and the usefulness of the system of classification has rendered it necessary for them to greatly enlarge their offices, which has been lately done under the superintendence of their architect, Mr. John Turner.

The ground floor of the building is occupied by the five surveyors for the Port of London; the first floor by the secretary and clerks; the board-room, a handsome apartment 37 ft. long, by 16 ft. 6 in. wide, and 15 feet high, occupies the whole frontage of the building on the second floor. The attics are devoted to the printing establishment attached to the office.

Some beautiful models, showing the construction of the several classes of shipping, are in the possession of the committee.

In the end of the last century an office was carried on for some time to insure persons against losses by thieves and highway robbers. Many projects have been formed to assure against losses by bankruptcies, insolvencies, and bad debts.

The *Guarantee Societies* are interesting examples of the principle of assurance. The Guarantee Society, and the others in imitation of it, give security in a bond, in consideration of a small premium (say ½ per cent.), against any defalcation by a clerk or other person in a situation of trust. Before giving bond for an applicant, a searching investigation is made into his character from his birth, so that the bond, when given, becomes likewise a testimonial of character, and many poor and friendless, but deserving young men, are thus enabled to take employment. Abroad, a person in public employment is frequently called upon to deposit a sum of money as a security in the *Caisse des Consignations*, or public funds, drawing the interest. Acting upon the system of the guarantee society, the Bank of England now calls upon its clerks to contribute, by a percentage, to a guarantee fund.

SECTION 7.—DUTIES ON ARTICLES IMPORTED INTO ENGLAND.—Here follows an enumeration of the several articles chargeable to the revenue, together with a list of such articles as have the benefit of Free-trade by a remission of charges. Such articles as are subject to payment have an additional charge of 5 per cent. made to the importer.

		£	*s.*	*d.*
Agates or Carnelians, cut, manufactured, or set	100*l.*	10	0	0
Ale and Beer	brl.	1	0	0
Almonds, not Jordan nor bitter	cwt.	0	10	0
Jordan	,,	1	5	0
Paste of	100*l.*	10	0	0
Amber, Manufactures of, not enum.		10	0	0
Apples, raw	bush.	0	0	6
Dried	,,	0	2	0
Aquafortis	cwt.	0	5	0
Arrow Root	,,	0	2	6
Bandstring twist	100*l.*	10	0	0
Barley, pearled	cwt.	0	1	0
Baskets	100*l.*	10	0	0
Bast ropes, twines, and strands	,,	10	0	0
Beads and bugles of glass	lb.	0	0	0½
Beads, arango, coral, jet, crystal, and not enumerated	100*l.*	10	0	0
Beer or Mum	brl. of 32 gal.	1	0	0
Produce of the Isle of Man, per brl.				
Spruce	brl. of 32 gal.	1	0	0
Blacking	100*l.*	10	0	0
Books, printed prior to 1801, bd. or or unbound	cwt.	1	0	0
Printed in or since 1801, bound or unbound	,,	5	0	0
In foreign living language, printed in or since 1801, bd. or unbound		2	10	0
*** Copyrights of books printed abroad are prohibited.				
Boots, shoes and calashes—Women's boots and calashes	doz. pr.	0	6	0
If lined or trimmed with fur, or other trimming	,,	0	7	6

Boots, *continued.*		£	s.	d.
Women's shoes, with cork or double soles, quilted, and clogs,	doz. pr.	0	5	0
If lined or trimmed with fur or other trimming	,,	0	6	0
Women's shoes of silk, satin, jean, or other stuffs, kid, morocco, or other leather	,,	0	4	6
If lined or trimmed with fur or other trimming	,,	0	5	0
Girls' boots, shoes, and calashes, not exceeding 7 in. in length, to be charged with two thirds of the above duties.				
Men's boots and shoes. If the quarter do not exceed 2¾ in. or the vamp 4 in. in ht. from the sole inside	,,	0	7	0
If either the quarter or vamp exceed the above dimensions but do not exceed 6 in. in height from the sole inside	,,	0	10	6
If either the quarter or vamp exceed 6 in. in height from the sole inside	,,	0	14	0
Boot fronts, not exceeding 9 in. in height	,,	0	1	9
Ditto, not exceeding 9 in.	,,	0	2	9
Boxes of all sorts, excepting those made wholly or partly of glass, on which the proper glass duty will be levied	100*l.*	10	0	0
Brass, Manufacture of	,,	10	0	0
Powder	,,	10	0	0
Brass and copper wire	,,	10	0	0
Bricks or clinkers (Dutch)	1000	0	10	0
Other sorts	,,	0	15	0
Brocade of gold or silver	100*l.*	10	0	0
Bronze, manufacture not particularly enumerated	,,	10	0	0
Powder of	,,	10	0	0
Buck wheat	qr.	0	1	0
Meal	cwt.	0	0	4½
Butter	,,	0	10	0
Buttons, Metal	100*l.*	10	0	0
Covered with silk, &c., 15*l.* per cent.				
Cables (not being iron cables), tarred or untarred	cwt.	0	6	0
If and when otherwise disposed of	100*l.*	10	0	0
Taken from foreign ships, and cut into lengths not exceeding three fathoms	,,	10	0	0
Cameos	,,	5	0	0
Camphor, refined	cwt.	0	5	0
Candles, Spermaceti	lb.	0	0	3
Stearine	,,	0	0	1¼
Tallow	cwt.	0	5	0
Wax	lb.	0	0	2
Canes, Walking, or sticks, mounted, painted, or otherwise ornamented	100*l.*	10	0	0
Cantharides	lb.	0	0	3
Capers, including the pickle	,,	0	0	6
Cards, Playing	dozen packs	4	0	0
Carmine	oz.	0	0	6
Carriages, all sorts	100*l.*	10	0	0
Casks (empty)	,,	10	0	0
Cassava powder	cwt.	0	2	6
Cassia lignea	lb.	0	0	3
Catlings	100*l.*	10	0	0
Chalk, prepared or manufactured	,,	10	0	0
Cheese	cwt.	0	5	0
Cherries, raw	100*l.*	5	0	0
Dried	lb.	0	0	6
Chicory, or any vegetable matter applicable to the uses of chicory or coffee:—				
Roasted or ground	lb.	0	0	6

Chicory, *continued.*		£	s.	d.
Raw or kiln-dried	cwt.	1	0	0
China or porcelain ware, painted, or plain, gilt, or ornamented	100*l.*	10	0	0
Cider	tun	5	5	0
Cinnamon	lb.	0	0	6
Citron, preserved in salt	100*l.*	5	0	0
Clocks	,,	10	0	0
Or watches of any metal, impressed with any mark or stamp, appearing to be or to represent any legal Brit. assay mark or stamp, or purporting, by any mark or appearance, to be the manufacture of the United Kingdom . . prohibit.				
Cloves	lb.	0	0	6
Cocoa	,,	0	0	2
Husks and shells	,,	0	0	1
Paste and chocolate	,,	0	0	6
Coculus Indicus	cwt.	0	7	6
Coffee	lb.	0	0	6
Kiln dried, roasted, or ground, on and after 1st January, 1850	,,	0	0	8
Coir rope, twine and strands	cwt.	0	2	6
Comfits, dry	lb.	0	0	6
Confectionery	,,	0	0	6
Copper, Ore of	per ton	0	1	0
Old, fit only to be remanufactured	,,	0	2	6
Unwrought, viz. in bricks or pigs, rose, and all cast	,,	0	2	6
In parts wrought, viz. bars, rods, or ingots, hammered or raised	,,	0	2	6
In plates and copper coin	,,	0	2	6
Regulus of	,,	0	1	0
Manufacture of, not enumerated, and copper-plates engraved	100*l.*	10	0	0
Or brass wire	,,	10	0	0
Cordage, tarred or untarred (standing or running rigging in use excepted)	cwt.	0	6	0
If, and when otherwise disposed of	100*l.*	5	0	0
Corks, ready made	lb.	0	0	8
Squared for rounding	cwt.	0	16	0
Fishermen's	,,	0	2	0
Corn — upon all wheat, barley, Bear or bigg, oats, rye, peas, and beans	qr.	0	1	0
Upon all wheat, meal, and flour, barley-meal, oatmeal, rye-meal, and flour, pea-meal, and bean-meal	cwt.	0	0	4½
Cotton articles, or manufacture of cotton, wholly or in part made up, not otherwise charged with duty	100*l.*	10	0	0
Crayons	,,	10	0	0
Crystal, cut or manufactured, except beads	,,	10	0	0
Beads	,,	10	0	0
Cucumbers, preserved in salt	,,	5	0	0
Currants	cwt.	0	15	0
Dates	,,	0	10	0
Dice	pair	1	6	2
Earthenware, not enumerated	100*l.*	10	0	0
Eggs	120	0	0	10
Embroidery and needlework	100*l.*	15	0	0
Emeralds.—See Jewels.				
Ether, from Guernsey, Jersey, Alderney, Sark, or Man	gal.	0	18	9
Ditto, additional	,,	0	0	10
Essences not otherwise described, viz.:—				
Extract of cardamoms, coculus indicus, Guinea grains of paradise, liquorice, nux vomica, opium, Guinea pepper, Peru-				

Essences, *continued.*		£	s.	d.
vian or Jesuit's bark, quassia, radix rhataniæ, vitriol	100*l.*	20	0	0
Or preparation of any article, not particularly enumerated or described, nor otherwise charged with duty	,,	20	0	0
Feathers, not otherwise enumerated, dressed	,,	10	0	0
Ostrich, dressed	lb.	1	10	0
Paddy bird, dressed	,,	0	1	0
Figs	cwt.	0	15	0
Fish, anchovies	lb.	0	0	2
Eels	ship's lading	13	0	0
Lobsters		Free.		
Turbots	cwt.	0	5	0
Of foreign taking, imported from foreign places, in other than fishing vessels, viz.:—				
Oysters	bush.	0	1	6
Salmon	cwt.	0	10	0
Soles	,,	0	5	0
Turtle	,,	0	5	0
Fresh, not enumerated	,,	0	1	0
Cured, not enumerated	,,	0	1	0
Flowers, Artificial, not made of silk	100*l.*	25	0	0
Frames for pictures, prints, or drawings	,,	10	0	0
Fruit, raw, not enumerated	,,	5	0	0
Gauze of thread	,,	10	0	0
Ginger	cwt.	0	10	0
Preserved	lb.	0	0	6
Glass, viz.:—				
Any kind of window glass, white or stained of one colour only, not exceeding 1-9th of an in. in thickness, and shades and cylinders	cwt.	0	3	6
All glass exceeding 1-9th of an in. in thickness; all silvered or polished glass, of whatever thickness, however small each pane, plate, or sheet, superficial measure, viz.:				
Not exceeding more than 9 square ft.	sq. ft.	0	0	3
Containing more than 9 sq. ft. and not more than 14 sq. ft.	,,	0	0	6
Containing more than 14 sq. ft. and not more than 36 sq. ft.	,,	0	0	7½
Containing more than 36 sq. ft.	,,	0	0	9
Painted or otherwise ornamented	sup. ft.	0	0	9
All white flint glass bottles, not cut, engraved or otherwise ornamented, and beads and bugles of glass	lb.	0	0	0½
Wine glasses, tumblers, and all other white flint-glass goods not cut, engraved, or otherwise ornamented	,,	0	0	1
All flint cut glass, flint coloured glass, and fancy ornamental glass of whatever kind	,,	0	0	2
Bottles of glass covered with wicker (not being flint or cut glass) or of green or common glass	cwt.	0	0	9
And articles of green or common glass	,,	0	0	9
Average weight of glass bottles as taken by the Customs:—				

		Qts.	Pints.
English shaped bottles with Port or Sherry	per doz.	19 lbs.	11 lbs.
Champagne, and other wines in similar bottles¹	,,	24	15
Claret and other wines or brandy in similar bottles	,,	14	
Glass, *continued.*		Qts.	Pints.
Rhenish and other wines in similar bottles	per doz.	16 lbs.	11 lbs.
Geneva, square bottles, from 8 to 11 gills	,,	20	
Ditto, from 4 to 6 gills	,,	14	

		£	s.	d.
Manufactures not otherwise enumerated or described, and old broken, fit only to be remanufactured	cwt.	0	3	6
Gloves of leather, viz.:				
Habit mitts	doz. pr.	0	2	4
Habit	,,	0	3	6
Men's	,,	0	3	6
Women's, or mitts	,,	0	4	6
Gold, leaves of	100	0	3	0
Grains, Guinea, and Paradise	cwt.	0	15	0
Grapes	100*l.*	5	0	0
Gunpowder	cwt.	1	0	0
Hair, Manufactures of, or goat's-wool, or of hair or goat's-wool, and any other material, and articles of such manufacture, wholly or in part made up, not particularly enumerated or otherwise charged with duty	100*l.*	10	0	0
Hams of all kinds	cwt.	0	7	0
Harp or lute strings, silvered	100*l.*	10	0	0
Hats or bonnets, of chip	lb.	0	3	6
Bast, cane, or horse-hair, each hat or bonnet not exceeding 22 in. in diameter	doz.	0	7	6
Each hat or bonnet exceeding 22 in. in diameter	,,	0	10	0
Of straw	lb.	0	5	0
Felt, hair, wool, or beaver	each	0	2	0
Made of silk, or silk shag laid upon felt, linen, or other material	,,	0	2	0
Honey	cwt.	0	10	0
Hops	,,	2	5	0
Iron and steel, wrought, not otherwise enumerated	100*l.*	10	0	0
Isinglass	cwt.	0	5	0
Japanned or lacquered ware	100*l.*	10	0	0
Jewels, emeralds, rubies, and all other precious stones, set	,,	10	0	0
Latten wire	,,	10	0	0
Lead, Manufactures of, not enumerated	,,	10	0	0
Pig and sheet	ton	0	2	6
Leather cut into shapes, or any article made of leather, or any manufacture whereof leather is the most valuable part, not enumerated	100*l.*	10	0	0
Linen, or linen and cotton, viz.:—				
Cambrics and lawns commonly called French lawns, the piece not exceeding 8 yards long, and not exceeding ⅞ths of a yard broad, and so in proportion for any greater or less quantity.				
Plain	piece	0	2	6
Bordered handkerchiefs	,,	0	2	6
Lawns of any other sort, not French	100*l.*	10	0	0
Lace, thread	,,	10	0	0
Do. made by the hand, commonly called cushion, or pillow lace, whether of linen, cotton, or silken thread	,,	10	0	0
Damasks	sq. yard	0	0	5
Diaper	,,	0	0	2
Sails	100*l.*	15	0	0
Do. if in actual use thereof and when otherwise disposed of	,,	10	0	0
Articles, manufacture of linen, or linen mixed with cotton or wool, wholly or in part made up, not				

		£	s.	d.
Linen, *continued.*				
particularly enumerated, or charged with duty	100*l.*	10	0	0
Liquorice Roots	cwt.	1	0	0
Juice and paste	,,	1	0	0
Powder	,,	1	15	0
Macaroni and Vermicelli	lb.	0	0	1
Mace	,,	0	2	6
Maize or Indian corn	qr.	0	1	0
Meal	cwt.	0	0	4½
Marble, sawn, in slabs or otherwise manufactured	,,	0	3	0
Marmalade	lb.	0	0	6
Mats and matting	100*l.*	5	0	0
Mead	gal.	0	5	6
Medlars	bush.	0	1	0
Mercury, prepared	100*l.*	10	0	0
Metal, leaf (except gold), the packet	of 250 leaves	0	0	1
Mill boards	cwt.	1	10	0
Molasses.—See Sugar.				
Morphia and its salts	lb.	0	5	0
Mum	bar.	1	0	0
Musical Instruments	100*l.*	10	0	0
Mustard Flour	cwt.	0	6	0
Needle Work and Embroidery	100*l.*	15	0	0
Nutmegs	lb.	0	2	6
Wild in the shell	,,	0	0	3
Wild not in the shell	,,	0	0	5
Nuts, small and walnuts	bush.	0	2	0
Nux vomica	cwt.	0	5	0
Oil of almonds	lb.	0	0	2
Bays	,,	0	0	2
Chemical, essential, or perfumed	,,	0	1	0
Cloves	,,	0	3	0
Or spirits of turpentine	cwt.	0	5	0
Olives	gal.	0	2	0
Onions	bush.	0	0	6
Opium	lb.	0	1	0
Orange flower water	,,	0	0	1
Oranges and lemons, viz.:—				
In chests and boxes not exceeding 5000 cubic inches	box	0	2	6
Over 5000 cubic inches, and not exceeding 7300	,,	0	3	9
Over 7300 cubic inches, and not exceeding 14,000	,,	0	7	6
For every 1000 cubic in. exceeding 14,000	,,	0	0	7½
Loose	1000	0	15	0
Entered at value, at the option of the importer	100*l.*	75	0	0
Orsedew	cwt.	0	10	0
Painters' colours, manufactured	100*l.*	10	0	0
Paper, brown, made of old rope or cordage only, without separating or extracting the pitch or tar therefrom, and without any mixture of other materials therewith	lb.	0	0	3
Printed, painted, or stained, hangings, or flock	sq. yard	0	0	2
Waste, unless printed on in the English language, or of any other sort not particularly enumerated nor otherwise charged with duty	lb.	0	0	4½
Printed on in the English language.		Prohib.		
Pasteboards	cwt.	1	10	0
Pears, raw	bush.	0	0	6
Dried	,,	0	2	0
Pencils	100*l.*	10	0	0
Of slate	,,	10	0	0
Pepper, of all sorts	lb.	0	0	6
Percussion caps	1000	0	0	4
Perfumery, not otherwise charged	100*l.*	10	0	0
Perry	tun	5	5	0
Phosphorus	100*l.*	10	0	0

		£	s.	d.
Pewter, Manufacture of	100*l.*	10	0	0
Pickles, preserved in vinegar	gal.	0	0	4
Do. or vegetables, preserved in salt	100*l.*	5	0	0
Pictures	each	0	1	0
And further	sq. ft.	0	1	0
Above 200 square feet	each	10	0	0
Pimento	cwt.	0	5	0
Plate of gold, together with the stamp duty (17*s.* per oz.)	100*l.*	10	0	0
Silver, gilt and ungilt, do. (1*s.* 6*d.* per oz.)	,,	10	0	0
Platting or other manufacture to be used in, or proper for, making hats or bonnets, viz.:—				
Of bast, cane, or horse hair	lb.	0	10	0
Of straw	,,	0	5	0
Willow squares	100*l.*	10	0	0
Plums (commonly called French plums) and prunelloes	cwt.	1	0	0
Dried or preserved, &c.	,,	1	7	6
Preserved in sugar	lb.	0	0	6
Pomatum	100*l.*	10	0	0
Pomegranates	1000	0	5	0
Potato flour	cwt.	0	1	0
Pots, Melting, for goldsmiths	100	0	3	2
Of stone	100*l.*	10	0	0
Poultry	,,	5	0	0
Note.—The same rate applies to all species of game, alive or dead.				
Powder, Hair	cwt.	1	0	0
Perfumed	,,	1	0	0
Not otherwise, that will serve for the same uses as starch	,,	0	10	0
Prints and Drawings, plain or col., single	each	0	0	1
Do. bound or sewed	doz.	0	0	3
Prunes	cwt.	0	7	0
Puddings	lb.	0	0	1
Quassia	cwt.	0	10	0
Quinces	1000	0	1	0
Quinine, Sulphate of	oz.	0	0	6
Raisins	cwt.	0	15	0
Rice not rough, and in the husk	qr.	0	1	0
Rough ditto	,,	0	1	0
Saccharum Saturni	cwt.	0	10	0
Sago	,,	0	0	6
Sausages or puddings	lb.	0	0	1
Scaleboards	cwt.	1	10	0
Sealing-wax	100*l.*	10	0	0
Seeds, Mustard	cwt.	0	1	3
Trefoil	,,	0	5	0
Carraway, carrot, and clover	,,	0	5	0
Canary	,,	0	5	0
Grass, of all sorts	,,	0	5	0
Leek	,,	0	5	0
Lucerne	,,	0	5	0
Onion	,,	0	5	0
All other seeds[1]	100*l.*	5	0	0
Ships to be broken up with their tackle, apparel, and furniture (except sails), viz. foreign ships or vessels	,,	25	0	0
Foreign ships broken up	,,	10	0	0
Silk, manufacture of, or of silk mixed with metal, or any other material the produce of Europe, viz.:—				
Or satin, plain, striped, figured, or brocaded, viz.				
Broad stuffs	lb.	0	5	0
Articles thereof, not otherwise enumerated	,,	0	6	0
Or, and at the option of the officers of the Customs	100*l.*	15	0	0
Gauze or crape, plain, striped, figured, or brocaded, viz.				
Broad stuffs	lb.	0	9	0

Article	Unit	£	s.	d.
Silk, *continued.*				
Articles thereof, not otherwise enumerated	lb.	0	10	0
Or, and at the option of the officers of the Customs	100*l.*	15	0	0
Gauze of all descriptions, mixed with silk, satin, or any other materials in less proportion than one-half part of the fabric; viz.				
Broad stuffs	lb.	0	9	0
Articles thereof, not otherwise enumerated	,,	0	10	0
Or, and at the option of the officers of the Customs	100*l.*	15	0	0
Velvet, plain or figured, viz.				
Broad stuffs	lb.	0	9	0
Articles thereof, not otherwise enumerated	,,	0	10	0
Or, and at the option of the officers of the Customs	100*l.*	15	0	0
Ribbons, plain silk, of one colour only	lb.	0	6	0
——— plain satin, of one colour only	,,	0	8	0
——— silk or satin, striped, figured, or brocaded, or plain ribbons of more than one colour	,,	0	10	0
——— gauze or crape, plain, figured, striped, or brocaded	,,	0	14	0
——— gauze mixed with silk, satin, or other materials, of less proportion then one-half part of the fabric	,,	0	12	0
——— velvet or silk embossed with velvet	,,	0	10	0
Artificial flowers wholly or in part of silk	100*l.*	25	0	0
Manufactures of silk, or of silk and any other material called plush, commonly used for making hats	lb.	0	2	0
Fancy silk net or tricot	,,	0	8	0
Plain silk lace or net, called Tulle	,,	0	8	0
Manufactures of silk, or of silk mixed with any other materials, not particularly enumerated or otherwise charged with duty	100*l.*	15	0	0
Millinery of silk, or of which the greater part of the material is silk, viz.				
Turbans or caps	each	0	3	6
Hats or bonnets	,,	0	7	0
Dresses	,,	1	10	0
Manufactures of silk, or of silk and any other materials, and articles of the same, wholly or partially made up, not particularly enumerated or otherwise charged with duty	100*l.*	15	0	0
Silkworm gut	,,	10	0	0
Skins or furs, articles manufactured of	,,	10	0	0
Slate.—See Stone.				
Smalts	cwt.	0	10	0
Snuff.—See Tobacco.				
Soap, hard	,,	1	0	0
Soft	,,	0	14	0
Naples	,,	1	0	0
Spa ware	100*l.*	10	0	0
Spelter, or zinc, manufactures of.	cwt.	10	0	0
Spirits, or strong waters of all sorts—for every gallon of such spirits or strong waters, of any strength not exceeding the strength of proof by Sykes's hydrometer, and so in proportion for any greater or less strength than the strength of proof, and for any greater or less quantity than a gallon, viz.				
Not being spirits or strong waters the produce of any British possession in America, or any British possession within the limits of the E. I. C. charter, and not being sweetened spirits, or spirits mixed with any article, so that the degree of strength thereof cannot be exactly ascertained by such hydrometer	gal.	£0	15	0
The produce of any British possession in America, not being sweetened spirits, or spirits mixed with any article, so that the degree of strength thereof cannot be exactly ascertained by such hydrometer,—				
If imported into England	gal.	£0	8	2
,, Scotland	,,	0	4	0
,, Ireland	,,	0	3	0
Rum, the produce of any British possession within the limits of the E. I. C. charter, not being sweetened spirits, or so mixed as aforesaid, in regard to which the conditions of the Act 4 Vict. c. 8, have or shall have been fulfilled,—				
If imported into England	gal.	£0	8	2
,, Scotland	,,	0	4	0
,, Ireland	,,	0	3	0
Rum-shrub, however sweetened, the produce of and imported from such possessions, in regard to which the conditions of the Act 4 Vict. c. 8, have or shall have been fulfilled, or the produce of and importation from any British possession in America,—				
If imported into England	gal.	£0	8	2
,, Scotland	,,	0	4	0
,, Ireland	,,	0	3	0

Note.—All spirits, except the above, to be charged with the additional duty of 4*d.* per gallon. Also that foreign spirits may not be removed from England to Scotland, except from the bonded warehouse.

Article	Unit	£	s.	d.
Spirits or strong waters, the production of any British possession within the limits of the E. I. C. charter, except rum, in regard to which the conditions of the Act 4 Vict. c. 8, have or shall have been fulfilled, not being sweetened spirits, or spirits so mixed as aforesaid	gal.	£0	15	0
Spirits, cordials, or strong waters, not the produce of any British possession in America, or of any British possession within the limits of the E. I. C. charter, in regard to which the conditions of the Act 4 Vict. c. 8, have or shall have been fulfilled, sweetened or mixed with any article, so that the degree of strength thereof cannot be exactly ascertained by Sykes's hydrometer, and perfumed spirits, to be used as perfumery only	gal.	£1	10	0
Strong waters, except rum-shrub, being the produce of any British possession in America, or of any British possession qualified as aforesaid, sweetened or mixed with any article as aforesaid	gal.	£1	0	0
Cordials and liqueurs (except rum-shrub) being the produce of any British possession in America, or of any British possession within the limits of the E. I. C. charter, qualified as aforesaid, sweetened or mixed with any articles as aforesaid	gal.	£0	9	0
Spruce.—See Beer.				
Essence of spruce	100*l.*	10	0	0
Starch; cwt. 1*s.*				
Gum of, torrified or calcined, commonly called British gum	cwt.	£0	1	0
Staves, except staves not exceeding 72 in. in length, nor 7 in. in breadth, nor 3¼ in. in thickness	ld. 50 cubic ft.	£0	18	0
Steel, Manufacture of	100*l.*	0	10	0
Stone and slate, hewn	ton	0	10	0

Stone and slate, *continued.*

Marble, sawn in slabs, or otherwise manufactured	cwt.	£0 3 0
Succades, including all fruits and vegetables preserved in sugar	lb.	£0 0 6

NEW SUGAR DUTIES.

Sugar or Molasses:—

The growth and produce of any British possession into which the importation of foreign sugar is prohibited and imported from thence:—

Candy, brown or white, refined sugar, or sugar equal in quality to refined, for every cwt.—

From July 5 to July 5 inclusive.

1849	1850	1851
£0 16 0	£0 14 8	£0 13 4

White-clayed sugar, or sugar rendered by any process equal in quality to white clayed, not being refined, or equal to refined, for every cwt.—

£0 14 0	£0 12 10	£0 11 8

Muscovado, or any other sugar, not being equal in quality to white clayed, for every cwt.—

£0 12 0	£0 11 0	£0 10 0

Molasses, for every cwt.—

£0 4 6	£0 4 2	£0 3 9

And so in proportion for any greater or less quantity than a cwt.

Sugar or Molasses, the growth and produce of any other British possession:—

Candy, brown or white, refined sugar, or sugar equal in quality to refined, for every cwt.—

From July 5 to July 5 inclusive.

1849	1850	1851	1852	1853	1854
s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
20 4	18 8	17 0	16 4	15 4	13 4

White-clayed sugar, or sugar rendered by any process equal in quality to white-clayed, not being refined or equal to refined, for every cwt.—

16 11	15 5	14 0	13 5	12 10	11 8

Brown-clayed sugar, or sugar rendered by any process equal in quality to brown-clayed, and not equal to white clayed, for every cwt.—

15 8	14 4	13 0	12 5	11 10	10 0

Muscovado, or any other sugar, not being equal in quality to brown-clayed sugar, for every cwt.—

14 6	13 3	12 0	11 6	11 0	10 0

Molasses, for every cwt.—

5 5	4 11	4 6	4 4	4 2	3 9

And so on in proportion for any greater or less quantity than a cwt.

Sugar or Molasses, the growth and produce of any foreign country, and on all sugar or molasses not otherwise charged with duty:—

Candy, brown or white, refined sugar, or sugar equal in quality to refined, for every cwt.—

From July 5 to July 5 inclusive.

1849	1850	1851	1852	1853	1854
s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
24 8	22 8	20 8	19 4	17 4	13 4

White-clayed sugar, or sugar rendered by any process equal in quality to white-clayed, not being refined, or equal to refined, for every cwt.—

19 10	18 1	16 4	15 2	14 0	11 8

Sugar, *continued.*

Brown-clayed sugar, or sugar rendered by any process equal in quality to brown-clayed, and not equal to white-clayed, for every cwt.—

s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
18 6	17 0	15 6	14 6	13 0	10 0

Muscovado, or any other sugar, not being equal in quality to brown-clayed sugar, for every cwt.—

17 0	15 6	14 0	13 0	12 0	10 0

Molasses, for every cwt.—

6 4	5 9	5 3	4 10	4 6	3 9

And so on in proportion for any greater or less quantity than a cwt.

The Bounties or Drawbacks following to be paid and allowed upon the exportation from the United Kingdom of the several descriptions of refined sugar:—

Upon refined sugar in loaf, complete and whole, or lumps duly refined, having been perfectly clarified and thoroughly dried in the stove, and being of uniform whiteness throughout, or such sugar pounded, crushed, or broken, or sugar candy, the cwt.—

From July 5 to July 5 inclusive.

1849	1850	1851
£0 15 0	£0 13 9	£0 12 6

Upon bastard or refined sugar, broken in pieces, or being ground, or powdered sugar pounded, or crushed, or broken, for every cwt.—

£0 12 0	£0 11 0	£0 10 0

And so on in proportion for any greater or less quantity than a cwt.

Note.—Muscovado sugar imported into the Isle of Man, to pay 1*s.* per cwt.

		£	*s.*	*d.*
Tallow	cwt.	0	1	6
Tamarinds	lb.	0	0	3
Tapioca	cwt.	0	0	6
Tea	lb.	0	2	1
Tiles	100*l.*	10	0	0
Timber or wood, not being deals, battens, boards, staves, handspikes, oars, lath-wood, or other timber or wood, sawn, split, or otherwise dressed, except hewn, and not being timber or wood otherwise charged with duty,	ld. of 50 cub. ft.	0	15	0
Timber or wood deals, battens, boards, or other timber or wood sawn or split, and not otherwise charged	ld. of 50 cub. ft.	1	0	0
Staves, if exceeding 72 in. in length, 7 in. in breadth, or 3½ in. in thickness	,,	0	18	0
Firewood	fath. of 216 cub. ft.	0	6	0
Handspikes, not exceeding 7 ft. in length	120	0	12	0
—— exceeding 7 ft. in length	,,	1	4	0
Knees, under 5 in. square	,,	0	6	0
—— 5 in. and under 8 in. square	,,	1	4	0
Lathwood	fath. of 216 cub. ft.	1	4	0
Oars	120	4	10	0
Spars or poles under 22 ft. in length, and under 4 in. in diameter	,,	0	12	0
—— 22 ft. in length and upwards, and under 4 in. in diameter	,,	1	4	0
—— of all lengths, 4 in. and under 6 in. in diameter	,,	2	8	0
Spokes for wheels, not exceeding 2 ft. in length	1000	1	4	0
—— exceeding 2 ft. in length	,,	2	8	0

Timber, *continued.*		£	s.	d.
Wastewood, viz. billet wood and brushwood, used for the purpose of stowage	100*l.*	5	0	0
Wood, planed, or otherwise dressed or prepared for use, and not particularly enumerated nor otherwise charged with duty, viz.—4*d.* per ft. of cubic contents, and further	100*l.*	10	0	0

Note.—The additional duty of 5 per cent. is due on timber and wood from a British possession, but remitted on foreign produce.

Or, in lieu of the duties hereinbefore imposed upon wood by the load, according to the cubic contents, the importer may have the option, at the time of passing the first entry, of entering battens, batten ends, boards, deals, deal ends, and plank, by tale, if of or from foreign countries, according to the following dimensions, viz.:—

Batten and batten ends—		Not above 7 in. in width.	Not above 1¼ in. in thickness.	Above 1¼ in. and not above 2¾ in thickn.
Not above 6 ft. long	120	,,	£0 18 6	£1 17 0
Above 6 and not above 9 ft. long	,,	,,	1 7 9	2 15 6
Above 9 and not above 12 ft. long	,,	,,	1 16 11	3 13 10
Above 12 and not above 15 ft. long	,,	,,	2 6 3	4 12 6
Above 15 and not above 18 ft. long	,,	,,	2 15 4	5 10 8
Above 18 and not above 21 ft. long	,,	,,	3 4 6	6 9 0
Boards, deals, deal ends, and planks—		Not above 9½ in. in width.	Not above 1½ in. in thickness.	Above 1½ in. and not above 3¼ in thickn.
Not above 6 ft. long	,,	,,	1 9 10	2 19 8
Above 6 and not above 9 ft. long	,,	,,	2 4 5	4 8 10
Above 9 and not above 12 ft. long	,,	,,	2 19 2	5 18 4
Above 12 and not above 15 ft. long	,,	,,	3 14 2	7 8 4
Above 15 and not above 18 ft. long	,,	,,	4 8 11	8 17 10
Above 18 and not above 21 ft. long	,,	,,	5 3 8	10 7 4
Not above 6 ft. long	,,	Above 9½ in. and not above 11½ in width.	1 15 10	3 11 8
Above 6 and not above 9 ft. long	,,	,,	2 13 8	5 7 4
Above 9 and not above 12 ft. long	,,	,,	3 11 7	7 3 2
Above 12 and not above 15 ft. long	,,	,,	4 9 7	8 19 2
Above 15 and not above 18 ft. long	,,	,,	5 7 6	10 15 0
Above 18 and not above 21 ft. long	,,	,,	6 5 8	12 11 4

		£	s.	d.
Tin, in blocks, ingots, bars, or slabs,	cwt.	0	6	0
Foil	lb.	0	0	6
Manufact. of, not enumerated	100*l.*	10	0	0
Tobacco	lb.	0	3	0
Snuff	,,	0	6	0
Manufactured or segars	,,	0	9	0
Stalks and Flour of		Prohib.		
Tobacco pipes, clay	100*l.*	10	0	0
Tongues	cwt.	0	7	0
Toys, excepting toy and hand-mirrors, on which the plate-glass duty will be levied	100*l.*	10	0	0
Truffles	lb.	0	1	0
Turnery, not described	100*l.*	10	0	0
Turpentine, above the value of 15*s.* per cwt.	cwt.	0	2	0
Spirit or oil	,,	0	5	0
Twine	100*l.*	10	0	0
Vanelloes	lb.	0	5	0
Varnish, not described	100*l.*	10	0	0
Vegetable juice, to pay 10 per cent. as goods manufactured, T. O.				
Verdigris	cwt.	0	5	0
Verjuice	ton	4	4	0
Vermacelli and macaroni	lb.	0	0	1
Vinegar	tun	4	4	0
Wafers	100*l.*	10	0	0
Washing balls	cwt.	1	0	0
Watches of gold or silver, or other metal	100*l.*	10	0	0
Water, Cologne, the flask (30 containing not more than 1 gal.)		0	1	0
Wax, Sealing	100*l.*	10	0	0
Whipcord	100*l.*	10	0	0
Wine—The produce of the Cape of Good Hope, or the territories or dependencies thereof, and imported direct thence	gal.	0	2	9
Not enumerated, or otherwise charged with duty	,,	0	2	9
French, Canary, Madeira, Portugal, Rhenish, Spanish, and other sorts	,,	0	5	6
The full duties on wine are drawn back upon re-exportation or shipment as stores.				
Wine lees, subject to the same duty as wine, but no drawback is allowed on the lees of wine exported.				
Wire, gilt or plated, or silver	100*l.*	10	0	0
Woollens, viz.:—Articles or manufacture of wool, not being goat's wool, or wool mixed with cotton, wholly or in part made up, not otherwise charged	,,	10	0	0
Worsted yarn	lb.	0	0	6
Yarn, cable yarn	cwt.	0	3	0
Goods, wares, and merchandise, being either in part or wholly manufactured, and not being enumerated or described, nor otherwise charged with duty, and not prohibited to be imported into or used in Great Britain or Ireland, from foreign countries or British possessions	100*l.*	10	0	0

Articles admitted free.

- Agates or Carnelians not set.
- Alganobilla.
- Alkali.
- Alkanet Root.
- Almonds, bitter.
- Aloes.
- Alum.
  - Rock.
- Amber, rough.
- Ambergris.
- Amboyna Wood.
- Angelica.
- Annatto.
  - Roll.
- Animals, living.
  - Asses.
  - Goats.
  - Horses, Mares, Geldings, Colts, and Foals.
  - Mules.
  - Kids.
  - Oxen and Bulls.
  - Cows.
  - Calves.
  - Sheep.
  - Lambs.
  - Swine and Hogs.
  - Pigs, sucking.
- Antimony, Ore of.
  - Crude.
  - Regulus of.
- Argol.
- Aristolochia.
- Arsenic.
- Ashes, Pearl and Pot.
  - Soap Weed, and Wood.
  - Not enumerated.
- Asphaltum or Bitumen Judaicum.
- Bacon.
- Balsam, Canada.
  - Capivi.
  - Peru.
  - Riga.
  - Tolu.
  - Balm of Gilead, and unenumerated Balsam.
- Barilla.
- Bar Wood.
- Bark, for tanners or dyers' use.
  - Extract of, or of other vegetable substances to be used only for tanning leather.
  - Peruvian.
  - Cascarilla.
  - Other sorts.
  - Preparations of, for dyeing and cotton printing.
- Basket Rods, peeled and unpeeled.
- Beef, fresh or slightly salted.
  - Salted, not being corned.
- Beef Wood.
- Berries, Bay.
  - Juniper.
  - Yellow.
  - Myrobolane.
  - Unenumerated.
- Birds, singing.
- Blackwood.
- Bladders.
- Bones of cattle and other animals, and of fish (except whale fins), whether burnt or not, or as animal charcoal.
- Boracic Acid.
- Borax, refined.
  - or Tincal, unrefined.
- Bottles of Earth and Stone, empty.
- Box Wood.
- Brazil Wood.
- Braziletto Wood.
- Brimstone.
  - refined in rolls.
  - in flour.
- Bristles, rough or in any way sorted.
- Bronze Works of Art.
- Bullion—Coins, Medals, &c.
- Bulrushes.
- Cables and Cordage in actual use.
- Camomile Flowers.
- Camphor, unrefined.
- Camwood.
- Candlewick.
- Canella Alba.
- Canes, Bamboo.
  - Reed.
  - Rattans, not ground.
  - or Sticks, unenumerated.
- Caoutchouc.
- Cardamoms.
- Castor.
- Cassia Buds.
  - Fistula.
- Casts of Busts, Statues, or Figures.
- Caviare.
- Cedar Wood.
- Chalk, unmanufactured.
- Cherry Wood, being Furniture Wood.
- Chestnuts.
- China Root.
- Chip, or Willow, for platting.
- Chrystal, rough.
- Cinnabaris Nativa.
- Citrate of Lime.
- Citric Acid.
- Civet.
- Coals, Culm, and Cinders.
- Cobalt.
  - Ore of.
- Cochineal.
  - Dust.
  - Granilla.
- Coir Rope and Junk, old and new, cut into lengths not exceeding 3 feet.
- Colocynth.
- Columbo Root.
- Copperas, Blue.
  - Green.
  - White.
- Coral, whole, polished.
  - unpolished.
  - in fragments.
- Cordage in use in British ships.
- Cork.
- Cotton Manufactures, not being articles wholly or in part made up, not otherwise charged with duty.
  - East India piece goods, viz. Calicoes, and Muslins, white.
  - Do. dyed or coloured.
  - Handkerchiefs, dyed and coloured.
- Cotton Yarn.
- Cowries.
- Cranberries.
- Cream of Tartar.
- Cubebs.
- Cutch.
- Diamonds.
- Divi Divi.
- Down.
- Drugs, unenumerated.
- Ebony.
- Enamel.
- Feathers for Beds, in Beds or otherwise.
  - Ostrich, undressed.
  - Paddy Bird, undressed.
  - Unenumerated & undressed.
- Flasks, in which Olive Oil is imported.
- Flax and Tow, or Codilla of Hemp and Flax, dressed and undressed.
- Flocks.
  - *Note.*—Paper-stainers' Flock is subject to duty as manufactured goods.
- Flower Roots.
- Fustic.
- Gallic Powder.
- Galls.
- Gamboge.
- Garancine.
- Garnets, cut or uncut, not set.
- Gelatine.
- Gentian.
- Ginseng.
- Glue.
- Glue Clippings, or Waste of any kind, fit only for making Glue.
- Goods unenumerated, not being either in part or wholly manufactured, not enumerated, or prohibited.
- Grease.
- Greaves, Tallow.
  - for Dogs.
- Guano.
- Gum, Animi.
  - Arabic.
  - Assafœtida.
  - Ammoniacum.
  - Benjamin.
  - Copal.
  - Euphorbium.
  - Guiacum.
  - Kino.
  - Lac Dye.
  - Mastic.
  - Seed Lac.
  - Senegal.
  - Shellac.
  - Storax.
  - Tragacanth.
  - Unenumerated.
- Gun Stocks in the rough, of Wood.
- Gypsum.
- Hair, Camel or Wool.
  - Cow, Ox, Bull, or Elk.
  - Horse.
  - Human.
  - Unenumerated.
- Hay.
- Heath, for Brushes.
- Hellebore.
- Hemp, dressed.
  - rough or undressed, or any other vegetable substance

Articles admitted free (continued).

of the nature and quality of undressed hemp, and applicable to the same purposes.
Hides, not tanned, tawed, curried, or in any way dressed, dry and wet.
or pieces of, raw or undressed, and unenumerated.
tails, Buffalo, Bull, Cow, or Ox.
tanned, not otherwise dressed.
or pieces thereof, tawed, curried, varnished, japanned, enamelled.
Muscovy or Russia Hides, or pieces thereof, tanned, coloured, shaved, or otherwise dressed.
or pieces thereof any way dressed, not otherwise enumerated.
Hones.
Hoofs of Cattle.
Hoops of Wood.
Horns, tips and pieces of.
Indigo.
Ink for Printers.
Inkle, wrought.
unwrought.
Iron, Bloom.
Cast.
Chromate of.
in Bars, unwrought.
Hoops.
Ore.
Pig.
Old Broken and Cast Iron.
Slit or Hammered into Rods.
Jalap.
Jet.
Jewels, Emeralds, and all other precious stones, unset.
Pearls.
Juice of Limes, Lemons, or Oranges.
Kingwood.
Lac, viz.: Sticklac.
Lamp Black.
Lapis Calaminaris.
Lard.
Latten.
Shaven.
Lavender Flowers.
Lead Ore.
Red.
White.
Black.
Chromate of.
Leaves of Roses.
Leeches.
Lignum Vitæ.
Linens, plain Linens and Diaper, whether chequered or striped with Dyed Yarn or not, and manufactures of Linen, or of Linen mixed with Cotton or Wool, not particularly enumerated, or otherwise charged with duty, not being articles wholly or in part made up.
Litharge.
Live Creatures, illustrative of Natural History.
Logwood.
Losh Hides.
Madder.
Root.
Magna Grecia ware.
Mahogany.
Manganese, Ore of.
Manna.
Croup.
Manures, unenumerated.
Manuscripts.
Maple Wood.
Maps and Charts, or parts thereof, plain or coloured.
Mattresses.
Mats, Dunnage, not being of greater value than 10*s*. the 100.
Meat, salted or fresh, not otherwise described.
Medals of any sort.
Metal, Bell.
Minerals and Fossils, and living Creatures (illustrative of Natural History).
Models of Cork or Wood.
Moss, Lichen Icelandicus.
other than Rock or Iceland.
Rock, for Dyers' use.
Mother o' Pearl Shells.
Musk.
Myrrh.
Nicaragua Wood.
Nickel, Arseniate of, in Lumps or Powder, being in an Unrefined state.
Metallic Oxide of, refined.
Ore of.
Nitre, Cubic.
Nuts, Kernels of Walnuts, and all Nuts or Kernels unenumerated, commonly used for expressing Oil therefrom.
Coker.
Pistachio.
Chestnuts
Oakum.
Ochre.
Oil, Animal.
Castor.
Cocoa Nut.
of Olives.
Palm.
Lard.
Paran.
Rock.
Unenumerated.
Train, Blubber, Spermaceti Oil, and Head Matter, the produce of fish or creatures living in the sea, caught by the crews of British vessels, and imported direct from the fishery or from any British possession in a British vessel.
Train and Blubber, of Foreign fishing.
Seed, viz.:
Hempseed.
Linseed.
Rapeseed.
Walnut.
Seed, unenumerated.
Sperm of Foreign fishing.
Spermaceti.
Oil Seed Cake.
Olibanum.
Olive Wood.
Orange and Lemon Peel.
Ore, unenumerated.
Orchal.
Orpiment.
Orris Root.
Painters' Colours, unenumerated, unmanufactured.
Palmetto Thatch.
Manufactures.
Parchment.
Partridge Wood, being Furniture Wood.
Patterns of Silk, Woollen, and Cotton.
Pearls.
Pens.
Pink Root.
Pitch.
Burgundy.
Plantains.
Plaster of Paris.
Platina and Ore of Platina.
Plants, Shrubs, and Trees.
Olive.
Platting or other Manufactures to be used in or proper for making Hats or Bonnets of Chip.
Pomegranates, Peel of.
Potatoes.
Pork, fresh.
Pork, salted (not Hams).
Prussiate of Potash.
Purple Wood, being Furniture Wood.
Quicksilver.
Quills, Goose.
Swan.
Radix Contrayervæ.
Enulæ Campanæ.
Eringii.
Ipecacuanhæ.
Rhataniæ.
Senekæ.
Serpentariæ or Snake Root.
Rags, old Rags, old Ropes, or Junk, or old Fishing-nets, fit only for making Paper or Pasteboard.
Pulp of.
Woollen.
Rape of Grapes.
Red Wood, or Guinea Wood.
Rhubarb.
Rosewood.
Rosin.
Safflower.
Saffron.
Sal Ammoniac.
Limonum.
Prunella.
Salep, or Salop.
Salt.
Saltpetre.
Sanguis Draconis.
Santa Maria Wood.
Sapan Wood.
Sarsaparilla.
Sassafras.
Satin Wood.
Saunders' Red.
White or Yellow.
Scammony.
Seeds, Acorn.

Articles admitted free (*continued*).

- Seeds, *continued.*
  - Alganobilla.
  - Aniseed.
  - Beans, Kidney or French.
  - Burnet.
  - Colchicum.
  - Cole.
  - Coriander.
  - Croton.
  - Cummin.
  - Fenugreek.
  - Forest.
  - Garden, unenumerated.
  - Hemp.
  - Lentiles.
  - Lettuce.
  - Linseed and Flaxseed.
  - Lupin.
  - Maw.
  - Millet.
  - Parsley.
  - Poppy.
  - Quince.
  - Rape.
  - Sesamum.
  - Shrub or Tree.
  - Tares.
  - Worm.
  - Unenumerated, commonly used for expressing Oil.
- Senna.
- Shovel Hilts.
- Shrubs, Trees, and Plants.
- Shumach.
- Silk, Raw.
  - Knubs or Husks, and Waste.
  - Thrown, not Dyed.
  - Thrown, Dyed, viz.:—Singles or Tram, Organzine or Crape Silk.
- Skins, Furs, Pelts, and Tails, or pieces of Skins, raw or undressed, unenumerated.
  - Furs, Pelts, and Tails, or pieces of Skins, tanned, curried, dressed, unenumerated.
- Specimens of Minerals, Fossils, or Ores, unenumerated, exceeding 14 lbs. each.
- Speckled Wood.
- Spelter or Zinc, rolled but not otherwise manufactured.
  - crude in cakes.
  - Zinc oxide or white of.
- Spermaceti.
- Sponge.
- Squills, dried and not dried.
- Stavesacre.
- Staves, not exceeding 72 inches in length, nor 7 inches in breadth, nor 3½ inches in thickness.
  - Birch, hewn, not exceeding 3 feet in length, nor exceeding 8 inches square, imported for the sole purpose of making herring barrels for the use of the fisheries.
- Steel, unwrought.
  - Scraps.
- Stone in blocks, shaped or rough scalped.
  - Mill, Burr, Quern, and Dog, rough, shaped, or hewn.
- Straw or Grass for platting.
- Sweet Wood.
- Sulphur Casts.
- Talc.
- Tar.
  - Barbadoes.
- Tarras.
- Tartaric Acid.
- Teasles.
- Teeth, Elephants'.
  - Sea-cow, Sea-horse, or Seamorse.
- Telescopes.
- Thread, not otherwise enumerated or described.
- Terra Japonica, and Cutch.
  - Sienna.
  - Verde.
  - Umbra.
- Tin ore, and regulus of.
- Tornsal.
- Tortoise Shell or Turtle Shell, unmanufactured.
- Tulip Wood.
- Turmeric.
- Turpentine of Venice, Scio, or Cyprus.
- Turpentine, unless above 15*s.* the cwt.
- Valonia.
- Vases, ancient, not of stone or wood.
- Vegetables, all not otherwise enumerated or described.
- Vellum.
- Vermilion.
- Ultramarine.
- Walnut Wood.
- Water, Mineral.
- Wax, Bees, in any degree bleached.
- ——— unbleached.
  - Myrtle.
  - Vegetable.
- Weld.
- Whale Fins, of British taking, and imported direct from the fisheries, or from any British possession in a British ship.
  - Of foreign taking, and not prohibited.
- Woad.
- Wood, for ship-building, previously admitted at the same duty as Teak.
  - Birch, hewn, not exceeding 3 ft. long, nor exceeding 8 in. square, imported for the sole purpose of making herring barrels, for the use of the fisheries.
  - Fir, hewn, of the same dimensions, and imported for similar purposes.
  - Teak.
  - Furniture wood unenumerated.
  - New Zealand furniture wood.
- Wool.
  - Beaver.
    - Cut and combed.
  - Hares.
  - Coney.
  - Cotton.
  - Alpaca and the Llama tribe.
  - Cotton, or waste of cotton.
  - Goat's, or Hair.
  - Sheep or Lamb's.
- Woollens, manufactures of wool, not being goat's, or of wool mixed with cotton, not particularly enumerated or described, not otherwise charged with duty, not being articles wholly or in part made up.
  - Yarn.
- Yarn, Camel or Mohair.
  - Raw linen.
  - Raw worsted, not dyed nor coloured, and not being fit or proper for embroidering, or other fancy purposes.
- Zaffre.
- Zebra Wood.

Duties on British Goods exported.

Coals, culm, or cinders in a foreign ship, the ton, 4*s.*

Orphan Dues,

Payable upon Wines imported into the Port of London.

		s.	*d.*
Lisbon................	the pipe	2	3½
Portugal..............	,,	2	3
Cape and Madeira	,,	1	10
All other sorts	,,	2	2
French	the hhd.	1	0
Do.	case, ea.	0	3

ARCHITECTURE OF LONDON*.

The architecture of any old country or place long civilised, necessarily divides itself into two periods, the works of which are so widely different that, though merging the one into the other by imperceptible shades, those at the extremes of the scale present on many points a perfect contrariety, so that they cannot be rightly understood from the same point of view, or judged by the same rules. Not being warned of this distinction, many give up the subject in despair or disgust, as one destitute of fixed principles; because the identity of name has led them to confound what are really two arts, so opposite in character and objects, that the principles of each seem flatly contradicted when we attempt to apply them to the other. Before introducing the reader, therefore, to a series of monuments extending through eight centuries, we must endeavour in a few words to make him understand the broad distinction between ancient and modern building art, and the reason of the immense value attached to every relic of the former, however humble or fragmentary.

The objects of design in building might at first seem too obvious to admit of question, and, accordingly, in all countries, up to a certain stage in civilization, they have not varied. Convenience; comfort; resistance to the elements and to violence; durability; economy (or wise distribution of materials, so that none may be idle burdens); every kind of concord or congruity, between part and part, between part and whole, between the whole and its purpose, between each organ and its function, its properties and its uses, between appearance and reality (as the appearance of strength in whatever sustains, and of lightness in whatever is sustained; uniformity in that which is one thing, and multiformity in that which is a group of things); such are the simple ends which the builders of an early age set before them, and the pursuit of which gives to their works that appearance of design and singleness of purpose which renders them, like the works of nature, *always beautiful.* Animals and plants are beautiful, inasmuch as everything in them is governed by design, and nothing by chance; and these early buildings are more or less beautiful, in proportion as the appearance of design prevails over that of chance. There was, in those times, no distinction of arts into useful and fine, no clash between use and ornament, for they were identical. Fitness and beauty were two names for the same thing. The fitness of objects, their harmony of every kind, constituted their beauty, *i. e.*, their truth. Truth is beauty; and was the only kind of beauty then recognised. Arts advanced by the discovery of new kinds of congruity or truth, the further development of those already discovered, the detection and remedy of incongruities previously overlooked.

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* This account is confined to the works of *architecture,* as such. The other curiosities that any buildings here described may contain will be found elsewhere under the names of those buildings, as *Tower, Temple Church, Westminster Abbey, Greenwich Hospital, Cathedral, &c.*

But when the excellences of any art have been refined and exalted to a certain pitch, many causes conspire to turn aside the efforts of artists into another direction. Some, perceiving that works are admired in proportion to the evidence of art or design apparent in them, begin to display art or contrivance merely for its own sake; to meet difficulties of their own making; because in this way their ingenuity can be made more apparent to superficial observers, than by the further improvement of excellences already carried so far as to leave no room for very obvious and striking improvement. Less active minds, again, find the perfection which the art has now attained, rather matter of satisfaction and wonder, than a stimulus to its further advancement; and being dazzled by its general excellence, which blinds them to the small remaining defects, instead of applying themselves to the detection and remedy of these, they aim only at retaining the excellences of former works, or the *appearance* thereof, with less cost, either of study, or of manual labour, or of both. The chief aim is no longer to improve, but to cheapen, if not the works, at least the designs of them; to find easy and compendious ways of reproducing (or rather imitating) those appearances that have excited admiration. It is then that the word *effect* begins to become an important one in the mouths of artists. It means some peculiarity of appearance, that, having arisen from some excellence, has so constantly accompanied that excellence, as to become an indication thereof; so that people have learnt, whenever they see this effect, to infer, without further trouble, the presence of that excellence of which it was once the indication.

In the second stage of an art, then, its aim is no longer to improve upon the excellences of former works, but to reproduce or exaggerate the *effects* by which those excellences were accompanied. In cheap works, the effects are merely *imitated*, in pompous ones *exaggerated;* but in both alike, the end of the art has been changed, and is no longer EXCELLENCE, but EFFECT. In the architecture of England this great change took place in the 14th century; earlier in some branches of the art than in others, but in none much earlier than 1300, and in few later than 1350.

As long as art is truly progressive, and directed to excellences and to them alone, no one complains of the want of variety or novelty, even though the excellences aimed at be always the same. But when effect has become the paramount object, to which all others in turn are sacrificed, men begin to think it hard that so much must be paid, and so much endured, for the sake of repeating certain hackneyed effects; and it is natural to look abroad for other kinds of effect that have sprung from the pursuit of other excellences, or of the same under other circumstances, physical or social. Hence, travellers and antiquaries begin to extol, the public to demand, and artists to learn and imitate, first the building-forms of classical antiquity, and at length a variety of *styles* of architecture; *i. e.*, to represent the forms, and as far as possible the effects, characteristic of the buildings of various past ages and foreign nations. And thus the art of *building well*, becomes, step by step, entirely merged and forgotten in that of *so* building as to *represent* the peculiarities of some given class of *ancient* buildings; which is all that we now understand by the term architecture.

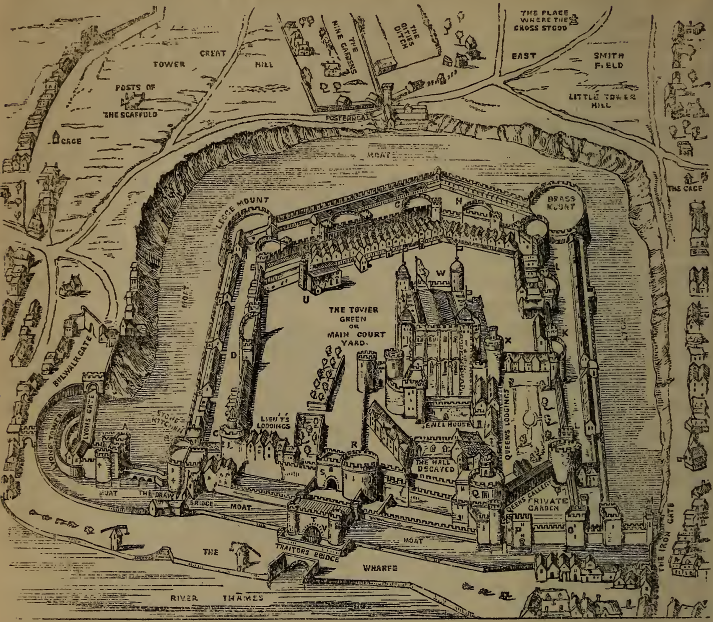
Good terms are wanting to distinguish these two kinds of building, or, indeed, of art in general. The words ancient and modern are too vague; and we cannot follow those who call the first period that of *invention*, and the latter that of *imitation*, for imitation seems needed alike in both, and invention in both, though differently directed. The ancient artists imitated (or even *copied*) from each other, quite as much as moderns from them; and, on the other hand, invention is shown in counterfeiting effects, as well as in developing excellences; and is required for the modern purpose of disguising the structure or uses of objects, as well as for the ancient one of expressing them. Indeed, the ingenuity of modern architecture is not duly appreciated. Should we not admire him who could consistently carry out the maxim that, "the use of speech is to conceal what we think"? and is not some applause also due to the success of an art, whose use is to conceal how and wherefore we build?

If, however, we call the old species, *original*, and the new, *representative* design, though the true distinction may not be fully expressed, perhaps no false one will be implied. We must add, that in the progress of representative art, from its infancy in the 14th century to its present giant development and universal triumph, three periods are to be distinguished; in the first of which, it was confined to the representation of certain effects of our own original style; in the second, it admitted freer and more completely scenic counterfeits, but was confined to one foreign style, and to the representation of its features, as a kind of alphabet to be recombined into designs which were still original as a whole. Lastly, the principle is extended to the representation of whole works, as well as their details, and, at the same time, allowed to embrace a variety of styles instead of one alone. We may thus, on the whole, divide English buildings chronologically into four periods. The first is that of *original* art; extending from the earliest times till the first appearance of sacrifices for effect (*i. e.*, to *represent* the effects of former excellences), which change we may date in round numbers, about 1350. The second period may be called that of *indigenous representative* art; and extends from the above date till the introduction of the systematised Italian architecture, by Inigo Jones, about 1600. The third includes the absolute reign of that system, which lasted till about

1780; and was the age of rule and measure, in details, though still requiring original art in general arrangement and ensemble. The fourth period is introduced by the admission of a plurality of styles; by the bursting, even in the established style, of all the barriers and restrictive laws intended to bolster up the expiring art; the extinction of the artificial life so long kept up. This period is distinguished from the former by unbounded licence and fancied liberty, though really enslaved more than ever to the representative principle, and to vulgar dictation, that has no idea of art but in the sense of deceit. It is the age of counterfeits more vast and refined than had previously been thought of; the age of "restorations" and of mock-antiques; of works representative not merely in their parts but as a whole; of the final complete triumph of representation, and exclusion of its rival, even from those branches of design on which it had, till now, retained some hold.

In such an age, peculiar interest attaches to the relics, however slight, that remain from the first period of art. Ever interesting from their excellence, and the rapid progress traceable throughout them; they are now become doubly so, from their entire opposition of principle to the works surrounding them. Always beautiful, even when erected; they have now acquired an adventitious beauty not then contemplated—the beauty of unpretence, of being the only honest, the only *real* objects, amid a wide waste of hollow counterfeits. This is what constitutes their *inimitable* beauty and *priceless* value; and this is why, without any of the antiquarian spirit, we must nevertheless mourn, as much as the most dusty archæologists, over the numbers of these precious irrecoverables lost from year to year. In London they are perhaps fewer than in any other city old enough to contain any. The successive ravages of iconoclasm, fire, coal smoke, a destructive climate, commercial cupidity, and (worst of all) the forgery called "restoration," have left this metropolis, (after sweeping off two of the finest monuments within these twenty years,) only *four* considerable portions of works of the age of unpretence; and a few minute fragments. To these we will conduct the reader in their chronological order.

The *Pix Office*, a low apartment adjoining the south-east corner of Westminster Abbey cloisters, claims to be the first piece of architecture in London, being apparently a part of the monastic buildings of Edward the Confessor, begun about 1050. This room is not accessible to the public, nor has it any peculiarity of design that may render it interesting, otherwise than for its antiquity and for being the most neat and well-wrought work of our Saxon ancestors remaining. Its extent is about 110 feet by 30, divided by a central range of eight plain round pillars, with simple capitals, and covered by a vaulted ceiling in 18 square groined compartments, similar to those used in Roman building seven centuries before; the only advance of art, during this long period, having apparently been the throwing off the disguises of an effete state of civilization, and the return to honest sterling unpretence.


GREAT
TOWER
HILL
POSTS OF
THE SCAFFOLD
CAGE
THE NINE GARDENS
THE CITIES DITCH
THE PLACE WHERE THE CROSS STOOD
EAST
SMITH FIELD
LITTLE TOWER HILL
POSTERN GATE
MOAT
THE CAGE
LEGGE MOUNT
BRASS MOUNT
MOAT
THE TOWER GREEN OR MAIN COURT YARD
BULWARK GATE
LYONS GATE
LYONS TOWER
STONE KITCHEN
LIEU'TS LODGINGS
JEWEL HOUSE
QUEENS LODGINGS
THE HALL DECAYED
QUEENS GALLERY
PRIVATE GARDEN
MOAT
THE DRAW BRIDGE
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THE
TRAITORS BRIDGE
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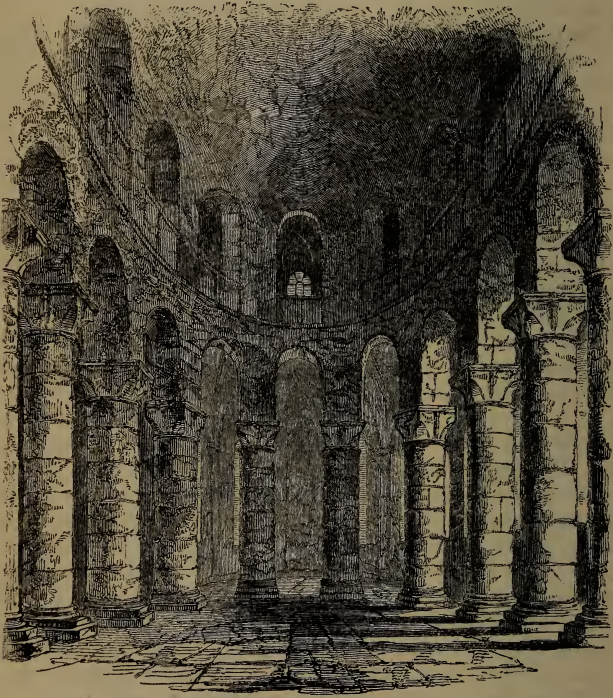
THE TOWER AND MOAT.

The *White Tower.*—This monument is the keep or nucleus of the Tower of London, that celebrated palatial fortress, so intimately mixed up in the whole eventful history of mediæval England. Those who approach the spot with any expectation to be reminded of these associations by any of the old objects and links between the past and the present, usual to such sites, will be utterly disappointed. No fortress of equal age has been so transformed; the two lines of walls and towers being weeded of every original feature, even to a loophole, and betraying their presence only by a few bald surfaces of stone peeping out from the casing and surmounting mass of hideous erections, presenting the double paradox (which no other country can offer) of design without beauty; and irregularity, dirt, and patching without picturesqueness. This arises from the fact, that in England (we believe nowhere else) art (in the sense of deceit) is necessary even where ornament is not attempted. There are other nations who cannot *decorate* buildings except by pretence, but we are the only one who cannot leave them *plain* without it. It is essential to bricklaying respectability that certain appearances should be counterfeited, and these happen to have a most unfortunate tendency. Their general model seems to be the packing-case, to assimilate with which, many sacrifices of convenience and durability in building must be made, such as the openings reduced to the shallowest practicable depth, and allowed the protection of no hood, every projection eschewed as far as practicable, and the roof either entirely hidden, or kept within the walls which common sense would have it to cover. Hence, whatever appearance of honesty, and whatever picturesque shadowing, arise, in the unadorned buildings of other countries, from the projections and recessions called for by the constructive requirements, must here be banished; the "respectability" even of the poorest and meanest requiring all such things to be suppressed.

From within this belt of ugliness will be seen rising two piles that replace those burnt in 1841, and are intended to be "in keeping" with the place;—a pretence in keeping with a reality. We may here see *castle* work and *castellated* work in juxtaposition, and form our opinion how they agree. The fine old pretenceless mass of the White Tower overtops the rest. Of this, again, only the general form and those of the windows remain ancient; everything except the plain surfaces having been remodelled.

There seems no foundation for the traditions that would ascribe to any part of this pile a date earlier than the first Norman monarch, who begun it in 1078, on the site of a work he had previously erected, and which is said to have been destroyed by floods. The architect of the present erection was Gundulph, Bishop of Rochester, whose skill in such buildings is shown also by a very similar castle at Rochester. The external dimensions of the White Tower are 116 feet long, 96 wide (with a semicircular projection 44 feet in diameter, formed by the apsis of the chapel), and the whole 92 feet high. The angular turrets rise considerably above the platform of the roof, how much originally it is now impossible to say. Three of these are square, their centres coincident with the centres of the walls, and their faces but slightly prominent. The stairs in them are circular. The north-eastern, which contains the principal staircase, is larger than the other three, circular without as well as within, and having its axis at what would be the external angle of the walls. There are also buttresses at uniform intervals, more prominent than is usual in Norman buildings, and diminishing upwards by slopes or weatherings that continue round their sides as well as their front. The external walls are from 10 to 12 feet thick, and the internal ones 7 feet, and of these there are only two, dividing each floor into three apartments, of which the largest measures 90 feet by 36, the next 63 by 28, and the smallest, in the south-east corner, would be about 28 feet square, were it not lengthened by the thickness of the east wall, and the radius of the semicircle beyond it. The whole building consists of four stories, of which the lowest is half underground, and now covered by modern brick vaults*. The other three are therefore very lofty, especially the top one, the largest room of which was the council chamber. The two larger rooms of each story are divided in the manner of a nave and aisles by two rows of wooden posts, to strengthen the floors above, which are of massive square beams. These posts also give to the rooms a stately proportion, the middle avenue being always higher than its breadth. The south-east apartment, however (or that with the circular end), is vaulted on every story. Its upper part forms the chapel, occupying the height of two stories, and having its gallery level with the upper apartments, and its floor with those below them. The gallery extends round its apsis, and along each flank, and is supported by



ST. JOHN'S CHAPEL, WHITE TOWER

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* Such solidity as this building possesses might be supposed to insure it against all ordinary casualties. Its huge masses seem to defy time, and even ordinary earthquakes, while they would never repay the trouble of wilful destruction. Yet a means has been found of jeopardising it. It will hardly be believed that *gunpowder* is stored in its basement (of all spots in England probably that in which its explosion would do most mischief); and, as if to increase this to the utmost, the upper stories are depositories of valuable *records!*

round columns below, that being the most convenient figure for columns that have to be walked round, while above, where this reason no longer exists, the pillars for supporting the ceiling are square. The intervals of these pillars, both above and below, are spanned, like the windows and all apertures throughout this building, by semicircular arches, because this was the method most suited to the economy of the material, as far as the science of the day could determine, and there was no reason for making them represent anything else. The vaultings are also of the simplest form available for their situation; those of the upper ceiling, both over the central space and over the galleries, being half cylinders; but below the galleries, such a ceiling, by springing above the crowns of the arches, would occasion a waste of height, and the Roman intersecting or groined vault is hence used, permitting the arches to be open to the full height of the aisle ceilings. As these require a square base from which to spring, the round columns end in square capitals, the connection of which with the circular shaft (being the only sunk work throughout the structure), is carved with devices different on each capital, and this is the only labour bestowed for ornament. The groining springs, on its outer side, from pilasters or internal butments, the intervals between which, having no need of equal strength, are recessed, to enlarge the capacity of the chapel, and vary the surfaces.

"Well," the visitor may now ask, "what is there remarkable in this very plain and unassuming apartment?" Nothing, probably, at the time of its erection, but it has *now* something very remarkable, which is this—Though everything be plain, is there anything mean? Though so little be wrought for ornament, and nothing *made* for ornament, is any ornament missed?—is any seen to have been grudged? No; with such rigid economy there is nothing niggardly, no evidence of a struggle between means and effect. Utterly without richness, there is yet no appearance of poverty. Look round and find the modern building, high or low, find the royal presence-chamber of which the same can be said—which is without mean subterfuges, make-shifts, make-believes. If you cannot, it follows that buildings of an early date have something besides their antiquity well worthy of notice, and something besides their style well worthy of imitation.

The Crypt of the Church of St. Mary-le-Bow (or *de Arcubus*), so called, it is said, from being the first church erected in London with stone arches; now commonly called *Bow Church*, Cheapside. This crypt, consisting of columns and simple Romanesque groining, is said to be of the age of the Conqueror. It has long been used as a dead-house, and is now quite filled with coffins.

Remains of St. Bartholomew's Priory Church, Smithfield.—Singularly interesting, both in matter and in manner, is the monkish legend that recounts the origin of this great monastery, and the adjacent noble hospital of the same name. With enchanting simplicity, it calls up a picture of an age so widely different from our own, as to be assigned by us the lowest rank in what we consider civilization; yet such a picture as almost drowns its shady traits, ignorance and superstition, beneath its faith, earnestness, unselfishness, and genuine humility. The miraculous embellishments to Rahere's history are few, and readily eliminated, but we should hardly know where to stop this process, or how to credit the main facts, did we not remember that this was the age in which another zealot, infinitely more misguided than he, could set half Europe at war with half Asia. It was not many years after the memorable preaching of Peter the Hermit, that this Rayherus, or Rayer, another penitent son of dissipation (originally, it is said, a court wit or minstrel), addressed himself in a similar style, but for a far worthier object, to Henry I., and then to the London populace, whose attention he could fix only by at first feigning madness. Penitence for his earlier life had led him on a pilgrimage to Rome, where a dangerous illness extorted from him a vow, that, if spared, he would found an hospital for sick men; and on his way back he had, in a vision, been commanded by the Apostle Bartholomew to commence, on an assigned spot in Smithfield, a house of prayer, to be peculiarly favoured and brought to a successful completion, if only begun and carried on in simple uncalculating reliance on the help of the patron, who declared himself the real doer of the work, and Rayhere only his humble instrument. The chosen spot was the most apparently irreclaimable bog in the suburbs, the place of public execution and all abominations, so that its cleansing was profanely ridiculed *before*, and regarded as a miracle *after* its accomplishment. With unquestioning faith, however, the king grants the two sites, and contributions of stone and labour pour in from all classes of the people, till he has completed, first the hospital in fulfilment of his vow, and then the church and convent in obedience to the vision*.

The architect appears to have been named Alfune, and the works were commenced either in 1113, 1123, or 1133, according to different versions of the above account, though the inscription on the modern hospital, not without authority we must presume, gives so early a date as 1102. Nothing remains of the ancient hospital, nor of the secular buildings of the monastery, though some beautiful cloisters†, and other fragments, remained as late as 1815, but being of the complete Gothic style, they could not have belonged to Rayhere's work. Time and violence seem to have done their worst, and yet to have been partly baffled by the fortress-like masonry "of good stoone, tablewyse," of this once noble temple. Houses are densely packed against its exterior, and the portions rising above them are entirely barbarized, with a completeness of which even modern London affords no other example. It will therefore be with no small surprise and pleasure that the visitor, on entering this black and hideous pile, will recognise the ruins of a Norman choir, its sturdy cylindric columns, its lofty triforium or gallery (now shut out by a wall behind its pillars), and the four grand arches that supported the central lantern of the cruciform edifice. The north and south arms of the transept are entirely gone (though the site of the latter remains open as a

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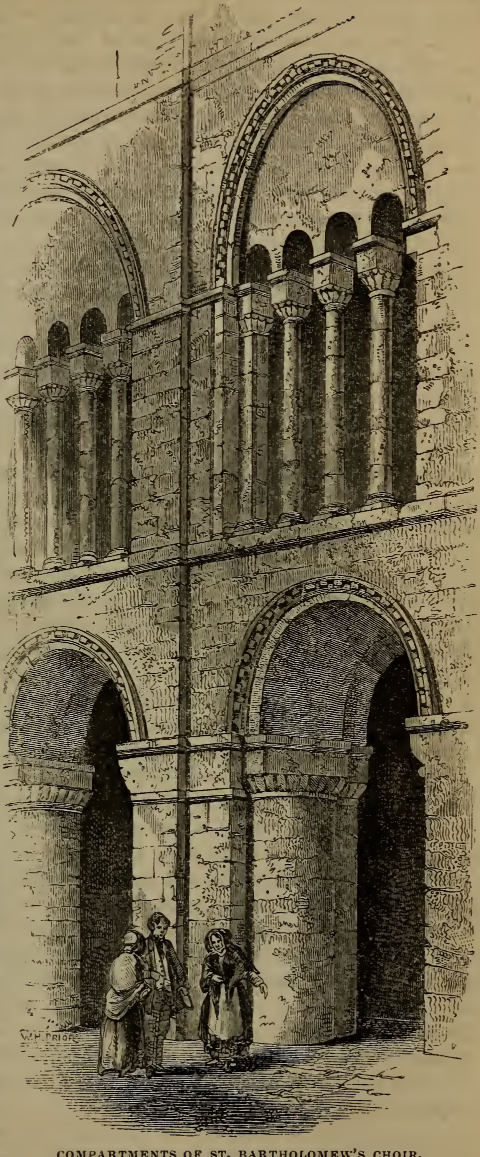
* Most of this beautiful legend may be found in Dugdale's "Monasticon," and in Malcom's "Londinium Redivivum," the former copying from a Latin version, and the latter from one in a most quaint dialect, perhaps the very earliest that can be called English. Neither gives it quite entire, but they mutually supply each other's omissions.

† *Middlesex Passage* leads under one defaced compartment of the vaulting of these cloisters.



COMPARTMENTS OF ST. BARTHOLOMEW'S CHOIR.

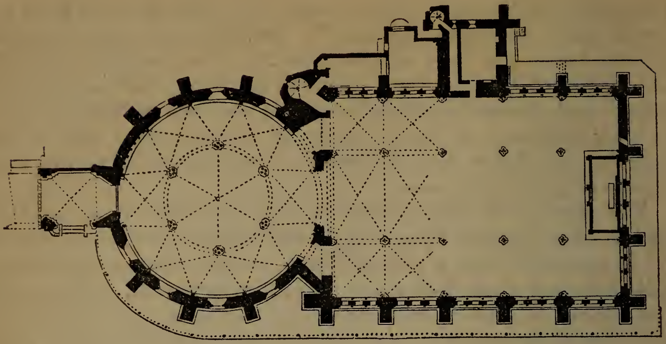
grave-yard), and of the western and longest arm, or nave, only part of the first bay or severy remains. This, together with the northern and southern of the four lantern arches, may possibly present the first examples of the pointed arch in this country. In undertakings of this nature, it was usual, in those days, to commence the building at the east end, and gradually extend it westward, by which means the work could be stopped at any point, and (being closed by a temporary front) serve the purposes of worship till funds should be forthcoming to extend it further, without disturbing the consecrated altar or any part already finished. Hence the four grand arches are probably the work of a successor of Rahere, and the destroyed nave is not unlikely to have presented (like that of Romsey, Hants) a progressive record of the improvement of architecture up to the erection of the west front, which extended to Smithfield, where the arch of the doorway to the south aisle remains, and now forms the entrance to a passage called Bartholomew Close. This presents a specimen of the refined grace this art had attained in the early part of the thirteenth century. Wide, indeed, is the contrast between Rahere's rude work, and this delicately-finished production only a hundred years later. At no other period, and in no other art, can we find a parallel to this rapid progress. Identical in their principles of construction, the two specimens of archwork present just that kind of difference which subsists between Stonehenge and the Parthenon; nor shall we be straining our analogy if we add, that the most *ornate* Norman architecture bears to the finished Gothic (whether ornate or plain) precisely that relation which the Egyptian post-and-beam building bore to the Greek. In each case, the rude and the refined, the stationary and the progressive style, attempt the same problem, the elaboration and adornment of the same structural core, but they attempt it by widely different methods. In the first, beauty seems to be measured by the number of lines or surfaces; in the second, by the amount of thought and observation of nature, shown in the neatness, fitness, and congruity of every feature. One method is governed by fancy, the other by judgment; one seems to aim at placing all the manual labour that can be afforded, where it may most show itself; the other, where it will display most thought, contribute most to the intrinsic excellence of the whole, and make it most resemble the works of nature. The first process is properly called *ornamentation;* the other, *decoration* (*i.e.*, rendering decorous). The Norman, like all savages, for the sake of ornament neglects geometrical accuracy and mechanical finish. The Greek and the Gothicist look on these qualities as of primary importance, and attempt nothing else till they are attained. As for the Norman ornaments, many of them (the zigzag, and especially the billet-moulding, the most common in this building) are worthy of Hottentots; and the example of every savage tribe may show, that this mere fancy ornamentation has no tendency towards progressive refinement. When, indeed, the true path has been once found, the refinement originating in structural parts may be applied to such features as these, and thus, in the infancy of the Gothic system, some of these Norman fancies (the zigzag, for instance) were refined and polished (as may be seen in the arch in Smithfield), but a fuller admission of the principle of decorum soon led to their rejection, and before the complete development of the Gothic architecture they all disappeared.

The choir of St. Bartholomew's originally ended in an apsis, but that is now replaced by a straight wall, and the semicircle thus cut off is converted into a charnel-house. The surrounding aisle, or ambulatory, forming more space than the congregation require, is also partitioned off. It is perfectly similar to that in the White Tower, but its vaulting seems to have fallen, and been replaced by a plaster imitation. In judging of the proportions of the church, we must remember that the bases of the columns are hidden, by what depth of accumulation it is impossible, without digging, to say; yet we descend steps to enter, so that the external ground must have risen several feet.

The present monument to Rahere was erected about 1410, and is a very poor specimen of a design very common at that time. The strange excrescence of an oriel window projecting from one of the triforium arches, was probably a whim of those to whom Henry VIII. appropriated the priory buildings after their seizure.

St. Mary's Church, Inner Temple.—The Knights Templars had an establishment in London as early as the reign of Stephen, and removed it to the place where their church now stands, in that of Henry II. This edifice (now belonging to two legal societies named after it) is one of those in which the plan of the Holy Sepulchre Church at Jerusalem was imitated, so far as regards the attaching a rotunda to the western extremity of an ordinary rectangular church. The rotunda remains as built in 1185, but the present rectangular part, or choir, is one which replaced the original and was dedicated in 1240. Both are peculiarly interesting as monuments of a period of unparalleled activity and progress in original architecture. The rotunda is one of the earliest examples in this country, of that important step, the substitution of pointed arches for round ones; and the other erection is one of the first examples of the *exclusive* use of the new arch, which thus took about half a century to establish itself completely and supersede the old one. Of course, so gradual, deliberate, and universal a change, and one which, when once adopted, maintained its ground for centuries, can be ascribed to no mere freak of taste or fancy. It was adopted because conducive, in several ways, to structural excellence; and, like all improvements in building thus introduced, it appeared first in the larger parts, and gradually descended into all the details.

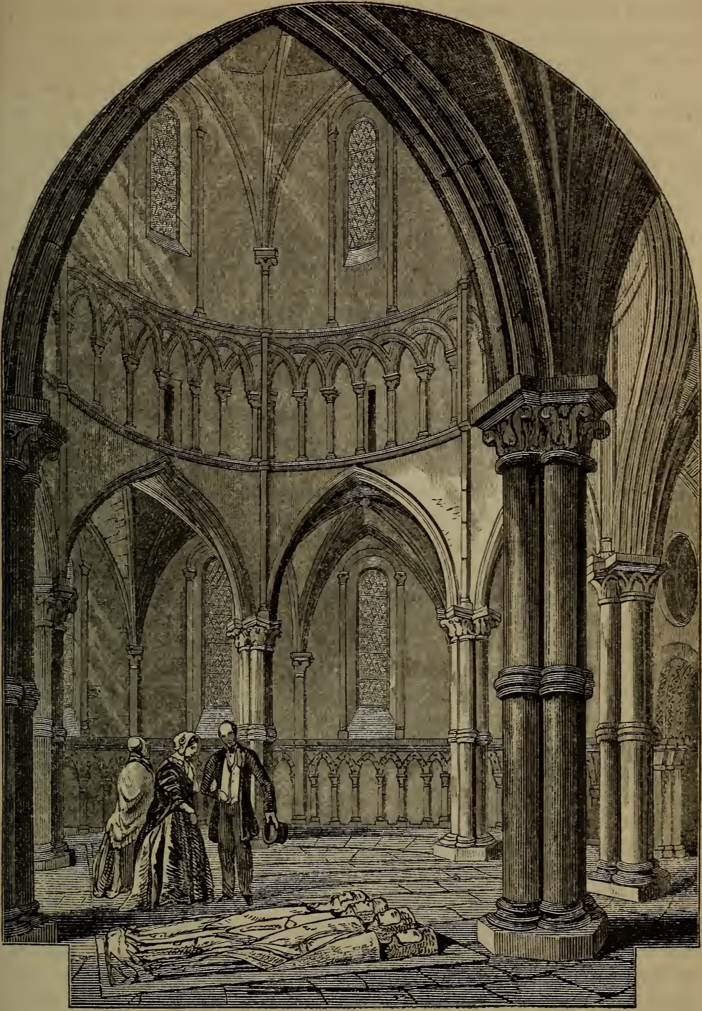
In the plan of this rotunda there is a peculiar and beautiful sym-



PLAN OF THE TEMPLE CHURCH. (THE NORTHERN ADDITION IS MODERN.)

metry hinted at, but not carried out; nor does any succeeding architect appear to have appropriated the idea here suggested. The six pillars occupy the angles of a hexagon, on each side of which figure a square is constructed, and the outer corners of these six squares form twelve equidistant points in the external circular wall; these are occupied by "responders," or wall-pillars, and, if both these and the six isolated pillars had been joined to each other by ordinary arches, making the external circuit a regular dodecagon, and the inner a hexagon, the intermediate space would have consisted of six perfect squares and six equilateral triangles, producing an exquisite symmetry and completeness in the ceilings. But for the sake of making every part of the building circular (a mere affectation), this beauty was sacrificed, by making the arches (both from pillar to pillar, and from wall-shaft to wall-shaft) arches of double curvature, almost the only ones in existence perhaps, which are at once circular in their plan and pointed in their elevation. This, which never can be required by any real necessity in building, only gives immense trouble and labour in the stone-cutting, to render the arches weak both in reality and in appearance, and, therefore, singularly unsightly. Nor is this the only instance here of the sacrifice of an excellence to a whim. The interlacing blank arches in the upper rotunda plainly belong to this class, and (unlike such inventions as the pointed arch) soon disappeared, however fashionable in their day. There were many such freaks about the time of the rise of Gothic architecture, but the sound judgment of those great, though nameless, artists who founded that system, and their unwavering pursuit of fitness and decorum, enabled them to weed out these superfluities.

In every part of this structure, however (except, perhaps, the windows), we find the progress made during half a century shown, not merely in enrichment or complication of parts, but in the complication of precisely those which could most harmoniously be so treated; not of those which might present either the most obvious, the most



INTERIOR OF THE ROTUNDA, TEMPLE CHURCH.

usual, the easiest, or the newest field for such treatment. The changes are so well studied and thoroughly weighed that they seem merely necessary corrections to the former style, or to supply deficiencies in it, which we now see, but had not before noticed. Thus the great cylindric shaft was a form too massive to be proper in a pillar built up of numerous little stones. This is lightened by division into a cluster of minor shafts, and these arranged to give the most convenient outline, in the best position for not obstructing the light and view. The arches must partake of both these changes. Their massive broad flat faces and square edges give place to delicate and deep-cut mouldings, with a general conformity to the shape of the pillar whence they spring. Again, in the vaulting (for whose support all this apparatus is provided), the sharp edges, or groins, which, in the White Tower Chapel, seem the mere chance intersection of the two surfaces, are really the parts on which the whole rests, and in strengthening them, the later artists, of course, give them the structure and appearance of the other arches, only with smaller mass, (because they are subordinate in situation, and support less mass,) but cutting them into the same species of deep mouldings; and the same treatment is extended to all the bands and separating lines of the structure, and vast study bestowed on the grace and fitness of all their various profiles.

How much easier would it have been for these designers to have consulted novelty instead of fitness; and, instead of these deeply-sought, slowly-discovered improvements in decorum rather than decoration, to have adopted every pretty fancy (every new-fangled form of arch that could be executed, for instance), and to decorate by sticking about carvings wherever there was most convenient room for them, or they would best display themselves. Greater variety, novelty, and enrichment, would have been attainable with far less trouble than they took,—but then we should have had no Gothic architecture.

In the rectangular church, of 1240, we find this system pushed further, and assuming that completeness of simple elegance, peculiar to the early Gothic of this country, and which constitutes the style very fitly named the Early English. The windows are here not only decorated with mouldings, consistently with the other parts, but are arranged in groups to fit the contour of the vaulting, to which, indeed, everything else, both within and without, refers, and is subservient. The painting of the interior, lately renewed, unfortunately drowns some of its more permanent and substantial beauties, especially the exquisitely shadowing mouldings, and the mutual relief and contrast afforded by these objects, and the broad surfaces intermixed with them. It is probable that the archway from the rotunda into the choir was originally partly occupied by an organ, not entirely shutting out one part from the other, but softening the incongruous junction of two styles, and obviating the necessity for an unsymmetrical excrescence, such as that now added on the north side, for holding that necessary piece of furniture. We need not add, that the design of this and the other woodwork is a forgery; its closeness of resemblance to the ancient forms preventing no one from seeing that, being entirely *representative* (of stonework), it cannot pass for the sign-manual of an age of non-representation. The glass painting is also modern, and, by comparison with what it imitates, it would appear that the progress made in six centuries has been to render drawing rather more rude, expression more uncertain, composition much more confused, colours less clear and immensely fewer in number, their contrasts harsh instead of harmonious, the glass rather dirtier and obtainable in no larger pieces, the joints rather clumsier.

The usual fault of Gothic building, ill-poised thrust of arches and vaults, has much injured the interior beauty, by bending all the pillars outward; although the vaulting has an ingenious (perhaps unique) contrivance for obviating this, by *loading* the narrow side vaults more than the broad central one, with a view to equalise their thrusts. But having no means of calculating, the designer could only guess at the difference, and so did not provide sufficiently. Yet it does not appear that we can do any better. It is said, indeed, that mathematics and engineering have made some advances since the thirteenth century; but foreigners will say, if it were so, surely those who lately spent such vast sums on the decoration of this building, would have devoted a portion of what they expended in paint to the correction of this glaring defect; and, if not restoring the pillars to their true position, would at least have arrested their further displacement, by the shifting of a little rubbish, to complete, *numero pondere et mensurâ*, what the original architect could only arrange by guess.

Outwardly, the importance of the buttresses and subordinate character of the walls in Gothic building, begins to be fully displayed. The principle of economizing stone, by reducing all the forces acting on it to *compression* alone, is sufficiently carried out to display within the wondrous lightness of this architecture*. The pillars are only 2 ft. thick through the whole deeply-hollowed cluster, and the outer walls are almost replaced by glass, being reduced from their original office of *supports* to that of mere *enclosures*. The matter is not wasted in them, but collected in the buttresses, whose depth from within to without exceeds 9 ft. at the base. As they rise, they diminish by offsets on the outer face only, and not on the sides, for their form and dimensions, each way, are regulated by the strictest economy. This upward diminution, in one direction only, was stigmatised by Wren as "uncomely," and, doubtless, it is so when left in unredeemed rudeness, as in the less exposed parts of most English Gothic works, and in all modern imitations. But in condemning, on this account, "all Gothic buttresses," that great artist certainly overlooked the various expedients by which the Gothic designers succeeded in obviating or polishing off this defect. In the finest foreign examples (as Cologne), the uncouth offset is studiously avoided in the plainer buttresses, and in the enriched ones it takes the form of a housing for a statue, or a cluster of pinnacles. In the Early English, or, at least, in its first examples (as Salisbury Cathedral, that great work which may be considered to have formed and fixed this national style), the same thing is still more artistically effected, without ornament, by continuing the weatherings, required on the front of the buttress, round its sides also; and afterwards only the lower weathering and moulding of each set was thus continued (as in the example before us), the expedient gradually giving place to that of a *gablet*, or miniature roof, sloping to each side from the middle of the buttress, and varied in many ways; and finally, by giving buttresses wholly or in part the form of polygonal turrets, as in Henry the Seventh's Chapel. Some of these contrivances (all having the same purpose) were rarely omitted in important buildings, and never in their principal fronts. We may add, that the evident care bestowed not only to thus modify these features, but, whenever practicable, to dispense with them altogether, shows the idea of building buttresses as *ornaments* to be entirely of modern origin.

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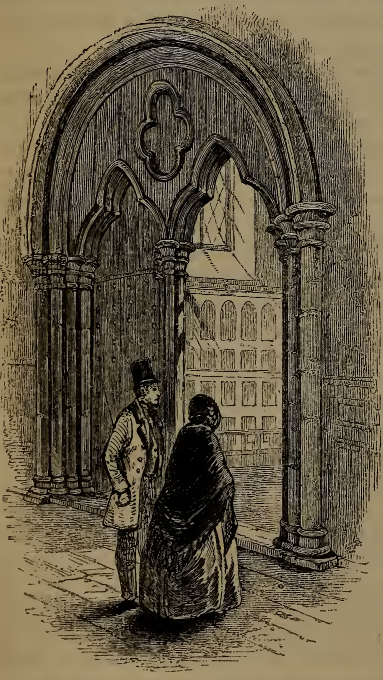
* Weale's Papers on Architecture.

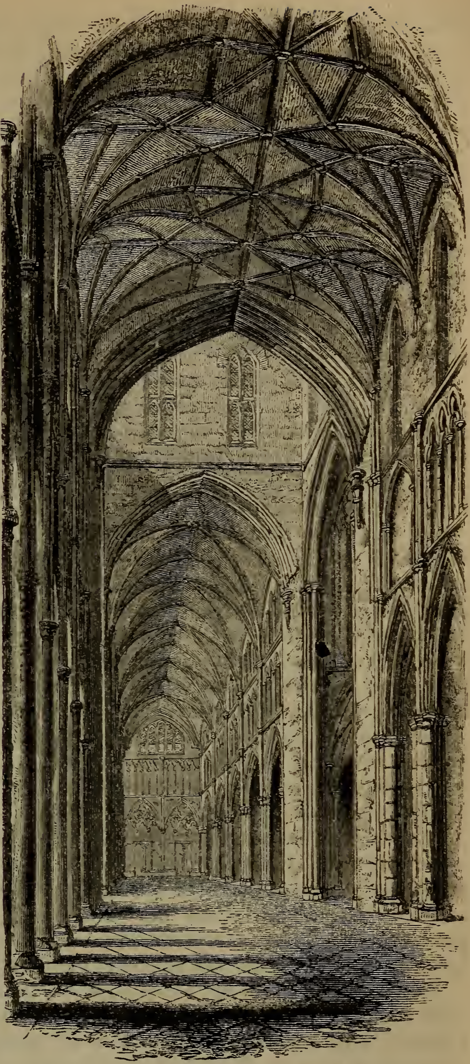
The chief internal dimensions of this building are—the rotunda 58 ft. in diameter, and the choir 58 ft. by 82. The clear breadth of the middle aisle in the latter, and the inner circle or lantern in the former, are each 23½ ft.; that of the side aisles, and the surrounding circular aisle, each 15½ ft.; and the vaulting of this last is 27 ft. high, but that of all three straight aisles is 37 ft. The lantern ceiling is modern. Its height is 60 ft., which is also that of the central ridge of the three high-pitched roofs over the straight aisles.



DOORWAY TO LAMBETH PALACE CHAPEL.

Lambeth Palace Chapel retains a crypt, a doorway, and its windows in the same style as the last part of the building just described. These features are of great beauty, but the chapel has otherwise been quite barbarized, and the remainder of this archiepiscopal residence, though founded as early as the reign of Cœur de Lion (before which it was a residence of the bishops of Rochester), now forms only a confused medley of buildings, with no other fragment older than the 15th century.

Remains of St. Mary Overy, now St. Saviour's, Southwark.—A remote Saxon origin is assigned to this


ST. MARY OVERY, FROM THE NAVE NOW DESTROYED.

monastery, which was at first a nunnery supported by the profits of the adjoining ferry on the site of London Bridge. After various changes, and being refounded as a priory of canons regular in the reign of Henry I., it was destroyed by fire in 1213, and rebuilt by Peter de Rupibus, Bishop of Winchester, and guardian of the young king Henry III. The present fragment consists of the eastern arm and transept of this church, which was cruciform, and (like St. Bartholomew's) of the second class as regards magnitude. Its style, wherever not patched, is therefore coæval with that of the Temple Church choir, but the exterior has greatly suffered from the admixture of dates, especially the south transept, which was probably remodelled after another fire that destroyed the priory in the reign of Richard II. Of the same period, or later, is the design of the pinnacles over the choir aisles, and probably the carcase of the tower, which was barbarized into its present aspect in the 17th century. The more shameless pauperism of yet later times obtrudes itself in the sides of the north transept; but its end*, and all the other parts of the exterior were, one by one, as funds could be afforded, undergoing careful renovation in better stone than the original; when a sudden reaction of parochial opinion, more merciless than any of the conflagrations of old Southwark, swept off the whole nave (till then less patched than any other part), and thus one of those priceless treasures, of which England, and its capital especially, had so few to spare—a piece of original building art—a thing which the whole power of the modern world cannot produce, yet thinks it worth while to imitate—was first petted for some years at great expense, and then reduced for ever to a mutilated fragment; and this for the sake of a paltry rood of ground, on which to erect—we will not say what—but leave the visitor to form his own impressions of the metropolitan "Gothic" of 1840.

In the interior of the ancient fragment, the choir has an aspect remarkably firm and majestic for one of second-rate scale, chiefly on account of the lines retaining their straightness and verticality much better than is usual in Gothic buildings. This is attributable partly to the large mass and well-placing of the flying buttresses, and those large counterpoising pinnacles above mentioned, but more to the shortness of the aisle pillars, which, when made loftier (as at Salisbury and Westminster), were liable to be thrust inward at their capitals by the vaultings of the aisles. This building is superior in permanence of equilibrium to either of those stupendous works, and is perhaps the best piece of engineering of its age; but this it mainly owes to retaining that proportion between the three stories which was usual in the round-arched, and particularly in the Norman buildings, instead of heightening the lower arches and aisles at the expense of the second story (or triforium), as was was done in most edifices after the change to the pointed arch, contributing to that general loftiness so proper in the new style, to accord with its tallness of features and aspiring character of forms. This Romanesque lowness of the aisles affects especially their windows, which become in consequence dwarfish. The central avenue, however, is nobly proportioned, and enables the spectator to realize the grandeur and unity of the whole, when the nave continued the same design throughout its seven compartments, and the tower formed a square lantern, open to double the height of the four avenues.

The altar-screen is an addition, evidently belonging to an age of luxury and "effect." It is certainly not earlier than the 15th century, and said to be erected by Bishop Fox of Winchester. It is the least elaborate of four on the same general idea, of which the earliest is at Christchurch, Hants, a larger at St. Alban's, and the largest and richest at Winchester Cathedral. The screen covers two archways of the original building, leading into the Lady Chapel. This is now entered only from the ends of the aisles. It is remarkable for its position, lying across from north to south, and (having three aisles of equal height) is almost an exact miniature of the Temple choir.

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* It is curious to observe how short-sighted parsimony has outwitted itself. Along the north side of this building, the only two bits of finished exterior, stuck on to save appearances, are now precisely the only parts that can by no means be seen. The north end of the transept was well restored, but the reader has only our word for it.

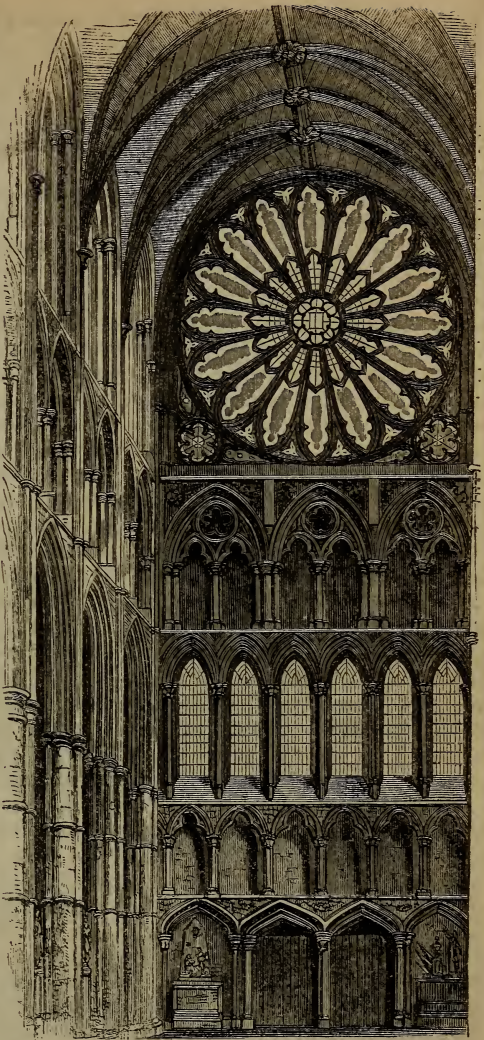
The details throughout this building are perhaps less elaborate than in any contemporary works of the same class, but they regularly increase in quantity and depth of moulding, from the lower to the upper parts; and (like all works of original architecture) however plain, they never give the smallest impression of meanness or inability to make them as complete as the designers *would* have them. This expression, so subversive of all handsomeness, is peculiar to *representative* art; for where nothing is represented, we cannot meet with any symptom of insufficient, poor, or starved representation.

The tomb of Gower, in the south transept, is a favourable specimen of the sepulchral memorials of that age. The poet contributed largely to the repairs of the building after the fire about 1400.

Westminster Abbey Church.—Though singularly few in number, the remains of original architecture in this capital include one production, in many respects unrivalled even among works produced, like itself, almost at the very meridian of that art; when it had nearly reached the very highest pitch of refinement ever attained perhaps in any country, without verging in its new direction towards representative design. Not only does this national masterpiece exhibit, in its best parts (those erected by Edward I.), the very purest and most perfect Gothic style in existence (that which has its various members most equally developed), but the whole structure is (with the sole exception of the early English paragon at Salisbury) the most complete and uniform monument of original art in this country. Though standing on this score, however, second, it does so *longo intervallo;* for while the early English fane was begun and finished in one lifetime, this (though on an uniform design) was carried on through many successive generations, all of whom left their stamp in the minutiæ of details; and still remains, like most of the mediæval temples, at once unfinished and partly in ruins. While it requires, at the former edifice, a critical eye to detect the few and unimportant mutilations; here (owing to the unfortunate selection of the stone) every eye is offended by the wholesale patching of the exterior with rude makeshifts; the intended central steeple (no less requisite for stability than for beauty) is wanting, and its absence supplied by expedients that must eventually entail ruin on the whole; the eastern chapel is replaced by an incongruous erection; the three end fronts of the building are all re-modelled, the cloisters patched in many styles, and the chapter-house virtually demolished; all which members, in the Salisbury group, remain intact. Still, the noble proportions and outline defy mutilation even on the exterior, and internally the whole is almost of a piece, except the three great windows at the north, south, and west extremities.

The site of this famous minster was originally surrounded by the Thames, and correctly described as "Thorny Island," on which, about the year 610, Sebert, king of Essex (including Middlesex), having embraced Christianity at the preaching of Augustine's missionary, Mellitus, immediately founded the small church which was the nucleus of this splendid edifice. In the time of the last of our Saxon monarchs, the establishment still consisted only of "a few Benedict monkes under an abbote serving Christ; very poor they were, and little was given them for their reliefe." The royal Confessor, however, having vowed a pilgrimage to Rome, which he found no opportunity of making, sent a solemn embassy to Leo IX., to beg a dispensation, which was granted on condition of his giving part of the money allotted for his journey, to the poor, and with the remainder either building or rebuilding and endowing a monastery in honour of St. Peter. A tenth of his entire substance "as well in gold, silver, and cattle, as in all his other possessions," was forthwith devoted to this purpose, and sufficed to replace Sebert's little church by one "begunne in such sort as should become the Prince of the Apostles." This was probably equal in extent (though perhaps not in height) to the present fabric, for a single arch of the venerable pile still appears at a considerable height, outside the south end of the transept; and the grand remains at Winchester, as well as the measurements given in ancient chronicles, show that the works which Saxon piety considered to "become the Prince of the Apostles," were not the mean erections that our pride would fain suppose them, but fully equalled our present cathedrals in scale and solidity. The devout king commenced this building about 1050, and it was so far finished (perhaps without the nave), as to be dedicated on the Innocents' Day, 1065, only a week before his decease.

A hundred and fifty years later, the young Henry III. seems to have chosen this revered and now canonised monarch, as his patron and model; and in 1220, being still only thirteen years old, he begun the rebuilding of Edward's church, in the new and beautiful style then in course of development; but the part then erected was only the eastern or Lady chapel, now replaced by that of Henry VII. It probably resembled the works of the same nature, begun only the previous year at Salisbury, and about the same time at St. Mary Overy, or the somewhat later choir of the Temple Church. The oldest parts of the present building are in a more advanced style, the preparations for them, by pulling down the Saxon choir and central tower, not taking place till 1245; and the new choir and transept were opened with great pomp in 1269. As an advance beyond the triple groups of windows used in those buildings, we here have two tall arched lights, and a circular or rose-formed aperture between their heads, the whole formed into one window by one inclosing arch, and



NORTH END OF THE TRANSEPT, WESTMINSTER ABBEY.
(*The tracery and glass of the circular window is modern.*)

piercing the small triangular spaces left between the curves.

England contains elsewhere examples of every stage of this process, the passage from a group of windows to a compound window, and thence to a divided or traceried window, —showing this to be a spontaneous growth of the Gothic constructive principles, and not a mere fashion imported from the Continent: though it also sprung up there just as naturally, and perhaps more quickly attained its utmost development; for the windows at Cologne Cathedral (a work strictly contemporary with this) are more complete examples of tracery; while on the other hand, the pillars, mouldings, and vaulting are more advanced and refined here than at Cologne. The upper vaultings present, perhaps, the first instance of a rib (or rather a band of deeply-hollowed foliage) running along each ridge; but the general progress is seen less in the introduction of new features than in the studious attention to give the last degree of polish and grace to the proportions both of the smallest detail and of every larger division. This is almost the only Gothic building (at least in England) in which there is nothing stunted or dwarfish, or over lengthy, compared with adjoining objects, and yet the forms are by no means monotonous. Externally the peculiar range of triangular windows lighting the triforium is a most masterly contrivance, adding greatly both to beauty and grandeur, by its contrast with the tall stories above and below it, and by assisting us in a true estimation of the uncommon height of the whole. As for the interior of the same story, there is perhaps nothing else in the whole range of Gothic art so perfectly beautiful, whether seen in the sides of the building as a double colonnade with dark background, at the south transept end, where it is single and backed by windows, or at the north end by a plain wall. Hardly less elegant is the blank arcade that once continued round the whole interior under the lower windows, but of which faithless guardians have left only some small fragments unsold to gratify vulgar vanity. In a word, every feature and detail of this interior has a most rare completeness and harmony, whether viewed by itself or in connection with adjoining parts, or with the whole. Whether you take much or little, the portion thus separately viewed is beautiful and void of incongruity; and this, while it places beyond a doubt the unity and integrity of the original design, bears testimony to the wondrous amount of study bestowed on the adjustment of such various conflicting dimensions, every relation of which seems provided for and thought out.

In justice to so truly noble a design, the abbots and royal patrons who gradually continued the works westward from the transept, did not deviate therefrom, as was unfortunately the practice of the other finishers of ecclesiastical buildings. Hence, though protracted even into the fifteenth century, this structure was less affected by new styles and fashions, than many others whose construction extended through a far shorter period. The rage for windows of many divisions and complex tracery was not allowed here to break in upon the unity of the old design; and the only innovations admitted were in mouldings and points of mere detail; if we except the introduction of additional ribs (called *tiercerons*) in the main vault of the nave, a decided advance both in carrying out the Gothic constructive economy, and in producing a proper increase of intricacy and lightness toward the upper parts. The two circular windows were an alteration made in the age of Richard II., and the great western one, of the "perpendicular" fashion, as late as 1490. Of glass painting, that at the east end alone is antique; that at the north and west ends, modern and very good of its kind; that at the south, pseudo-antique presenting the same qualities as that of the Temple Church (p. 139).

The effect of following Edward the Confessor's old foundations is seen in some awkward irregularities of the place. The choir contracts in breadth before beginning to form the apsis or round termination*.

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* This may, however, be intended, as well as the gradual decrease in the breadths

The transept and main avenue are of equal breadth, but the transept aisles are considerably wider than the longitudinal ones, and to disguise this, the general width of the arches is made intermediate between these two widths. This renders all the eight arches next the central crossing unlike the others, a defect which could only be remedied by forming this part into an octagon, as at Ely Cathedral, a change also conducive to convenience and stability, as it would admit a larger congregation within hearing distance, and avert the ruin which the iron ties now necessary across the arches and aisles must sooner or later occasion*. Sir C. Wren thought with much reason that the polygonal outer inclosures of the four chapels surrounding the apsis were an afterthought, adopted during the erection of that part, for, as he observed, the two buttresses standing in the nooks formed externally between these chapels are quite needless. Yet we find buttresses similarly placed and equally superfluous, in Cologne Cathedral and other contemporary works of this kind. Much difficulty seems to have attended the planning of the cloister, which could not be brought close enough to the building to cover certain revered graves, without some unique and bold expedients. The northern arcade so closely adjoins the wall of the nave, as to require the placing its buttresses outside this cloister, and spanning over it; while the eastern cloister actually enters within the church, and is, for about half its length, inclosed in the south transept, and covered by its western aisle. These two arcades are of different periods in the reign of Edward I., but the two other walks (whose vaultings are of a most nice and finished geometrical character) are probably of the 15th century. From the south walk, the view of that side of the nave is very remarkable, the five tiers of arch buttresses (three spanning over the cloister and two over the aisle) forming a display of those features quite unparalleled.

In the centre of the eastern cloister, a gorgeously-enriched compartment marks the entrance to the chapter-house, now a repository for records. It was, when perfect, almost a *fac-simile* of that at

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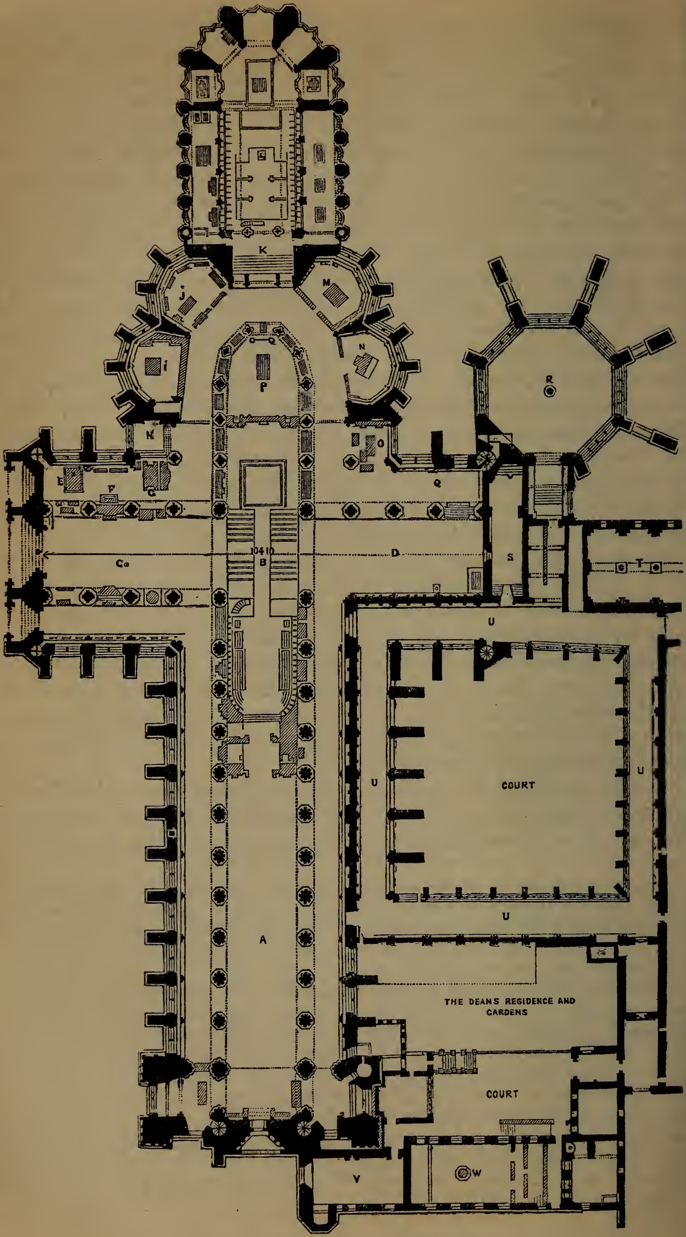
of the successive arches in the eastern arm of the building, to obviate the sudden change from the straight colonnades of the sides, to the curved and much more thickset range forming the apsis; the abruptness of which change in most choirs of this kind (as at Cologne, Amiens, &c.) almost disjoins the apsis from the rest, and makes it appear an afterthought.

* The dependence on these ties is entirely opposed to Gothic principles of building, but unavoidable here from the absence of the intended tower that was to steady its four supporting pillars against the thrusts that now bend them so perceptibly inwards. The removal of these four pillars and formation of an octagon would, as Sir C. Wren showed, answer this end still better, even without much superincumbent weight. But without the tower or the octagon, there is no remedy but either throwing four arches across in the middle height, like those at Wells Cathedral; or else continuing the metal ties throughout every arch in the building, an addition no doubt most objectionable, but not more so than the present ties which subject the whole to the effects of their expansion and contraction by heat and cold, besides endangering it by their constant decay.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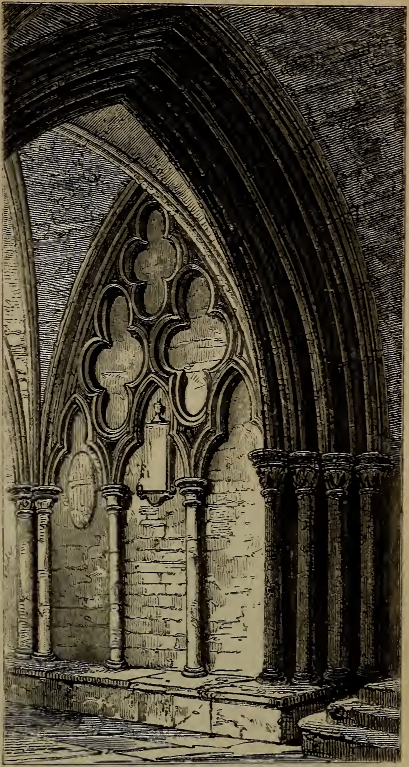
GROUND PLAN OF WESTMINSTER ABBEY.

Salisbury; an octagon room, surrounded, first, with a blank arcade, or range of stone stalls, exquisitely enriched, then with eight vast windows, each filling an entire side; and covered with vaulting springing from one central clustered pillar. The House of Commons usually met in this beautiful room (so admirably fitted for such an assembly) till the first year of Edward VI.

A sort of fatality seems to have attended the deviations from the original design, for every one of them has had in its turn to be replaced or mutilated. The west front of 1480–90 has left only its general features recognisable amid the havoc caused by Wren's bold but abortive attempts to improve the Gothic by additions of his favourite classic features. The northern wheel window of the transept has fared little better, being renewed in 1722, but certainly not restored; for, in Gothic building, all the stonework had a constructive meaning, the tracery of windows was not governed by fancy, and consequently they did not introduce inverted arches of stone hanging unsupported except by its adhesion. The corresponding south window has been twice restored; first, forty years before Wren's survey, who observed it was done *well*, which we may believe, from the purity of the present one, copied exactly from it by Mr. Gayfere, mason, in 1814. A fire in the roofs in 1803 led to a remodelling of the central rudimentary tower. The blank arches in its internal faces formerly opened into the roofs, and probably contained tracery. The whole is now much too bare, and the vaulting springing not only from the angles, but from the sides, where there is no butment, betrays itself to be only a piece of plaster scenery. The last addition, however, the woodwork of the choir, erected in 1847, is a very happy imitation of the mode in which the artists of the purest Gothic times treated this kind of



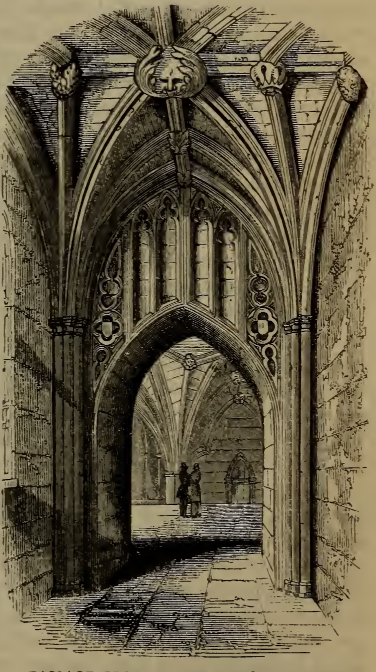
A COMPARTMENT OF THE CLOISTER WALLS.

semi-architectural furniture. Unluckily this is disfigured by puerile efforts to half suppress and half conceal the organ, in deference to the common notion that grandeur is measured by the number of feet we can see straightforward; this member having till then stood in its usual place, over the entrance from the nave, but without rising high enough to conceal either end of the building from a spectator on the floor at the other end. Its removal admits a view from the choir of nothing that was not previously seen, except the incongruous and meagre west window, the prominent advancing glare of which now marks the exact extent of the building, which formerly was most artistically concealed; for the vaulting of the nave being *nearly* all visible over the organ, but its length being just too great to be all seen, whether there were *little* or *much* beyond view, was left to the imagination; whereas now we are at once shown how short the building is.

The plan will show the chief dimensions of this structure, which is inferior to most of the English cathedrals in extent, but superior to any of them in height. Both in this respect, and in arrangement of plan, it resembles the ecclesiastical structures of France much more than those of England; and the ruling idea, as regards proportions, was to make the height of all apertures or vistas *thrice* their breadth, as will appear from these measures. Breadth of the main avenues 34 ft., height, 102; breadth of the tower arches, 33 ft., height, 99; mean breadth of aisles and their arches, 15½ ft., height, 46½; lower windows (clear opening), 10½ ft., height, 31½; upper windows, 10 ft., height, 30; triforium apertures, 3½ ft., height, 10½.

The sepulchral memorials that nearly fill the lower parts of this edifice are a subject we would fain leave untouched. The wide world presents probably no other such contrast as that between this matchless temple and the contents that profane it. History hardly suffices to establish so incredible a fact, as that one and the same people could descend in five centuries from *that* height of refinement to *this* unparalleled depth of vulgarity. In this spot are brought together, in their utmost intensity, the most opposite combinations of mental qualities—the noblest and the basest, the most lovely and the most odious that mute matter could by any torture be made to embody. Most humiliating is the thought that each of these things was once expected to please, was actually thought *beautiful*, when the very first step taken was the ugly brutal selfishness of hacking away the hard-thought, hard-wrought labour of pious heads and hands of old, to replace it by some rude mass of marble as a foil to "throw out" the new expression of private vanity. How revoltingly misplaced too is the shouldering, elbowing strife, with which, like advertising placards or rival shops, with every trick that can be devised for glaring prominence, they struggle to outstare each other, as if the very well-being of the defunct depended upon whose statue shall be seen first, or whose epitaph read oftenest. How calmly, amid all this feverish strife, lie the modest retiring memorials of the mighty or the worthy of old, from the dignified reposing figures of the royal Plantagenets to the unpretending brasses of the untitled and humble, if indeed modern selfishness has left any uncovered. No other nation possesses, or if possessing, could suffer the presence of so clamorous a witness of its degradation; and the time will probably come that the disgrace will be felt beyond endurance, the whole of the monuments since that of Islyp removed—those few that possess sculptural merit, to a fitter repository, the rest to be buried if possible in oblivion; and when the beauteous temple, cleansed from these defilements, and with the mouldings of its original decoration restored—for the carvings never can be—will contain only modest mementos of those really great or really buried within its walls, none occupying the floor, and none filling more than one window light, or one of the exquisite blank arches below; each of which affords ample space for any Phidias to mark with appropriate beauty the resting-place of any Newton; though not enough for vanity to supply the want of excellence by pomp and glare, nor to commemorate persons whose memory a pyramid could not by itself preserve.

St. Stephen's Crypt, Westminster Palace.—This, which is also called "St. Mary's Chapel in the vaults," formed the basement of St. Stephen's Chapel, famous for inclosing the room in which the House of Commons assembled, from the accession of Edward VI. till its destruction by the fire of 1834. That catastrophe, which swept off the flimsy representative erections of yesterday like stubble, raged in vain against the sterling reality of the old church-work. The chapel of the Plantagenets stood amid the wreck, not only unscathed, but purged of the rude accumulations of lath and plaster, and displaying the long-concealed beauties of its most elaborate and original decoration. The right-minded will not cease to deplore, nor enemies of England to remind her, that among the vast wealth devoted to her new Palace of Parliament, nothing could be done with this irrecoverable relic of the days of unpretence and sterling magnificence, but to raze


PASSAGE FROM ST. STEPHEN'S CLOISTERS TO THE CRYPT.

it to the ground; to destroy another precious lump of the material salt of the earth, because, being a work of the fourteenth century (and therefore in the style of the fourteenth century), it would not assimilate with—what?—with the style of the nineteenth?—no, with an unbuilt design in which it was our fancy to *represent* the style of the *fifteenth.* Now, if (as we have seen in the Abbey Church) those who wrought in the styles of their *own* times could respect the less perfect labours of their ancestors, and sacrifice a little uniformity to their preservation, it surely is rather hard that we, who pretend but to represent the styles of *other* times, cannot show the same respect; especially as, with us, it necessitates no breach of uniformity, since we can assume the style of any age that fancy may dictate. This stickling for such rigid unity of style seems, moreover, quite peculiar to the case in question, for we know of no other modern building in which it is held at all important. No one proposes, for the sake of unity, to rebuild the incongruous parts of Greenwich, Somerset House, or the British Museum, though they are not relics of an extinct art, nor remarkable for either interest or beauty; and considering that St. Stephens *was* very remarkable for both; considering, too, that it would have been so inclosed in the courts of the new palace as never, by any chance, to be visible simultaneously with any of its principal parts, we cannot help thinking this complex pile might have retained in its bosom that one relic of an earlier age, with as much grace as the Capitol retained its thatched hut, the Jewish Temple its curtained tabernacle, or the adjacent abbey and most of our cathedrals their Saxon, Norman, or Semi-Gothic remnants. But we do not say this to beg the question. Let the necessity for an absolute unity of style throughout the palace and all it contains, be admitted in its full rigour—then we say, that if the representation of some *past* style were indispensable, that of the *fifteenth century* style was not indispensable; and though it might have cost more to make a new design than to pull down this troublesome chapel—though economy might have been consulted in sacrificing the stone building to save the paper design, still we cannot but think that, however late the difficulties were discovered, and whatever the cost of rectifying past blunders, the *representative* buildings should have been assimilated to the *real;* and not the *real* rebuilt to fit the *representative.*

Thus, then, fell St. Stephens, a prey not to the fire but to the rebuilding; but happily the under-chapel, a specimen of a still purer style, escaped both ordeals, and now remains perhaps the most complete epitome of Gothic taste and science in existence. This little morceau just contains the rudiments, and no more, of every one of those methods of construction and design which Professor Willis has enumerated as essential to the completeness of the Gothic system; so that if all other examples were lost, this one would possibly enable us to reconstruct that system. It does not contain them, indeed, highly developed, for it is not only small and simple in form, but singularly free from over intricacy. Still, there they all are, and unadulterated with any of the whims that soon afterwards appeared and accompanied their fuller development.

This work is somewhat older than St. Stephen's Chapel itself was, having been commenced by Edward I. in 1292, and its incombustible structure withstood a fire that consumed the rest of the palace six years afterwards, as well as the catastrophe of our own days. Like other crypts, it is of course of low proportions, the height (which cannot be exactly known, from the loss of the original pavement) not exceeding the clear breadth. It has no division by detached pillars; but the masses projecting inwards, and, dividing window from window, take the form of short massive clusters, and the vault-ribs and all other members partake of the same bold thick character, so proper to a low interior, which, from the ceiling exceeding the surface of its supports, requires everywhere an expression of mass and strength. Such an example, coeval with what is commonly supposed the lightest and loftiest period of Gothic architecture, is a valuable proof of the versatility of that style which, like all real and original art, accommodates itself to these varying requirements, instead of sacrificing them—or else truth and consistency—to some supposed character of its own. The peculiar tracery of the windows is a masterly expedient to obviate the dwarfish effect of their low proportion. Though here exquisitely beautiful, it would be uncouth, because unmotived, in loftier windows. The east end, now destroyed, contained three equal windows, of two lights each, the vaulting being beautifully varied to fit their heads. This vault is an advance beyond that of the abbey nave, not only having the ribs called tiercerons, but admitting the principle that they may divide in the middle of their course into separate branches. We here also find the beautiful subordination of first-rate, second-rate, and third-rate members, or lines of mouldings, not only in the tracery, but (perhaps for the first time) in the vaulting. It would be impossible for all these principles to be exhibited in any work simpler or plainer than the present; and it is probably the only one that exhibits them all without displaying any symptom of decline, false luxury, or tendency towards representative design. If the Gothic architecture should ever again become a living art, should ever be readopted with a view to its future advancement, this is the point at which it would have to be taken up.

The dimensions of this little edifice are, internal length 91 ft.; breadth varying from 23½ ft. in the clear, to 33 ft. between the glass of the windows; height, to the springing, about 10 or 12 ft., above the springing, 12 ft.

This is the last fragment in London that can be decidedly classed in the first or progressive period of English architecture. It will be observed, that every step hitherto in the progress of this art originated in ecclesiastical buildings, and could never have occurred but for the consistent adherence to certain principles, two of which, at least, were quite peculiar to the church-builders of those times.

One of these was a certain spirit of sacrifice, that amounted to no less than the devotion of the *first* and *best* of everything, to a service that was supposed to

> "———— disdain the lore
> Of nicely calculated less or more."

It was thought necessary for sacred edifices not only to excel all secular ones, but to excel them in everything, in every imaginable kind of excellence. The other principle (no less peculiar to those times) consisted in the exclusive use, throughout all the visible parts of buildings, of a method of construction, which may be called the *compressive* method, because it makes use of only one kind of strength in the material, viz., its resistance to compression. It recognises no transverse, and no tensile strength, so that no portion of matter is allowed to bear a force, however small, tending either to bend or to stretch it.

Now, up to the commencement of the fourteenth century, every novelty introduced into church architecture (and not rejected again as a mere passing whim) had consisted in a further development of one or both of these principles; but in the next period, on which we are now to enter, every general and permanent change tends to a departure from the first of them, and generally from the second also.

Nothing shows this more conspicuously than the frequent erection of works of considerable splendour (resulting from the application of all the subordinate features and decorations of the Gothic system), but without the fundamental excellence for the sake of which this whole system was contrived, and without which, it has no meaning. As walls and pillars do not constitute an edifice, so neither do walls possessing the merits of durability, resistance to decay, or to fire, constitute a durable, a permanent, or a fireproof building. It is the *roof* that makes the house, and therefore no edifice can be called permanent which has not a permanent *covering*. Moreover, none can be comfortable, salubrious, or fit for constant use (uninterrupted by repairs) unless it have *two* independent coverings with a considerable space between (a necessity, which we admit in domestic buildings even to this day). Hence, as the early church-builders aimed at making those structures *better* than secular ones (not more *effective*), their efforts were directed first to little else than the accomplishment of this object, the covering of the largest and loftiest churches with a complete ceiling, independent of the external roof, and containing no combustible or decaying materials; a problem not easy in an unscientific age, and not accomplished in the neighbouring continental countries till late in the eleventh century, nor in England till near the end of the twelfth. This done, the next problem (that of the twelfth and thirteenth centuries) was the refining, beautifying, and harmonizing together, of this and all the other members of the building. The inner and permanent covering then is the soul of the whole organism; and the unity and congruity of what we call Gothic architecture consists in every feature being made for the vaulting; either mechanically to fit, sustain, or balance it; or æsthetically to harmonize with it. Hence arose that singular structural principle above-mentioned, that of universal compression. Hence, also, when this chief and governing member of the building was omitted, *both* the above principles were plainly abandoned; for, firstly, the innovation, instead of adding (as all previous innovations had done) a new excellence to sacred buildings, took away an excellence they hitherto had—and this without the smallest pretence of a substitute—simply grudged and denied it, for the sake of *cheapness* (or *effect*, which means here the same thing); and, secondly, as a timber roof or ceiling could not, from the nature of the material, be constructed on the compressive principle (and as the idea was not yet entertained, of representing a sham construction), all that system of decoration, founded on univerally compressive structure, and which was so beautiful and fit in the vaulted building, was now worse than thrown away, being a mere incongruity, since it must be flatly contradicted by the chief member of all, the ceiling or roof.

It is probable that the first important building in which this occurred was St. Stephen's Chapel. The great projection of its buttresses, indeed, as well as the commencement of the internal treatment, shows that it was intended by its founder, Edward I., to have been vaulted, like the crypt below (in which case it would have stood entire to this day); but, notwithstanding the destruction of the whole palace by fire in 1299, it is evident that when the work was proceeded with by Edward III., neither durability nor unity of design were thought so well worth paying for, as a dazzling display of minute ornaments; which must have cost more than would have sufficed to complete the original design, and to spare its finisher the distinction of being the introducer of makeshifts into ecclesiastical architecture—the *first* church-builder (probably in any country) who could not afford to build *so well* as those who preceded him.

Without knowing how the interior of the roof (or ceiling, if it had one) of this building was treated, it is impossible to say whether it belonged strictly to the class of *representative* works; but it will be observed, that so naturally and immediately does the new aim—effect—induce the new principle of design—representation—that, as soon as builders attempted to retain the Gothic character in works not intended to be vaulted, this principle might be said to appear; for the walls, &c., decorated in this manner, cannot be called Gothic architecture, but only a representation thereof, just as the Roman architecture was a representation of the Grecian*. Still, the works erected in the reigns of the second and third Edwards exhibit only the rudimentary tendency towards this new principle of design, and must therefore take an intermediate place between the first and second periods of building.

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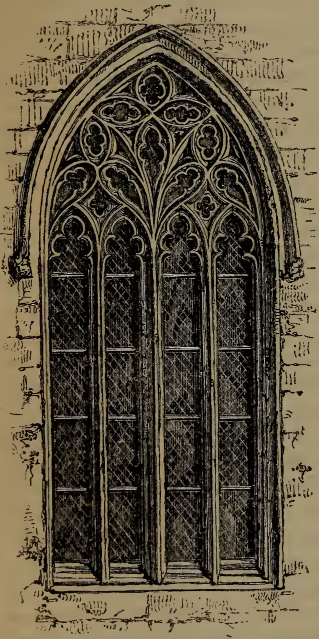
* That the Roman architecture (in the time of the empire) was entirely of the *representative* kind, like ours since the time of Edward III., has been observed above (note, page 122).

In London we have only two fragments of the works of this age, and these so modernized as to retain hardly a feature beyond the windows.

Ely Chapel, Ely Place, Holborn, belonged to the splendid palatial town-residence of the Bishops of Ely, which was founded about the beginning of the fourteenth century, but the precise date of the chapel is not known. The style, however, points evidently to the reign of Edward II., though the east window appears somewhat later than the rest. The west window is more elegant, but the side windows have lost their tracery, and retain only their external mouldings, which, together with the head of a very finished and beautiful doorway, in the south side, can be seen only by threading some narrow courts. The absence of buttresses, and disposition of the inside decorations, show that no vaulting was ever contemplated, and the representative character of these decorations is betrayed by their flatness, reminding one of the pilaster work applied to Roman and modern buildings, to represent, in shallow relief, the beauties of Grecian architecture. These walls now serve to inclose a Welsh place of worship.

The *Dutch Church,* formerly that of the *Augustine Friars, Broad Street, City,* consists of the nave only of the ancient building, which was erected in 1354, and had a transept and central spire, considered for centuries a chief ornament of the capital. This building belongs to the same class as the Temple Church, having no clerestory, but all three aisles nearly of equal height, on which account they are also nearly equalized in breadth, to prevent the centre one appearing dwarfish. The exterior having every feature pared off, to render it genteel (on the packing-case principle), no beauty of course remains but that of the window tracery, which is of the flowing kind, the most uncommon in England, being confined to the reign of Edward III., and never in general use even then. These windows are all alike, except the central west one; and, indeed, this style of tracery admits of far less variety than the preceding kind; and also of less variation in the mouldings, whence arises a flatness and shallowness, for which its other beauties cannot compensate.



WINDOW FROM AUSTIN FRIARS.

Of the first period of *Representative* architecture, viz., that in which artists confined themselves to the representation of the indigenous Gothic style, London retains as few specimens as of the original style itself; but of these few, there are two not less remarkable for unique design, than for a degree of splendour that places them in the first rank among the works of their respective classes.

Westminster Hall.—This most unique apartment—the greatest remnant in existence of Gothic palatial architecture—was erected by Richard II. between 1395 and his deposition in 1399.

All the exterior, as now visible, is of modern design, except the north porch and the window over it. These, with the whole of the internal stone-work, form one of the earliest specimens of what is called (from the number or prominence of lines at right angles to each other), the *perpendicular* style. This name applies to English architecture for about half the period that the pointed arch was in use; for the tendency to convert curves into vertical and horizontal lines began at the close of the Edwardian era, and continually increased till the breaking up of the last vestiges of Gothic design, under Elizabeth. All the other changes by which the Gothic passed into its later modifications are similar in spirit and principle to those by which the features of Grecian building were Romanized. They show a general aim to abridge thought, by diverting it from those niceties which court and satisfy prolonged inspection, and confining it to such points as conduce to the effect of the first *coup d'œil.* In every element (moulding, carving, tracery, &c.) there reigns the same tendency to find out, if not deceptive, at least *compendious*, mode of representing the admired effects of former art. In everything, even where there is augmented *apparent* enrichment and complication, there is *real* simplification or saving of thought; and the accumulation of these compendious methods and artistic tricks, tended of course to increasing sameness, and the reduction of the art more and more to rule and routine.

With regard to the gorgeous roof which forms the chief part of this edifice, we cannot but regard it as holding that place among mediæval structures which the Colosseum held among those of antiquity, and bearing that relation to the Gothic temples which that amphitheatre did to the Grecian ones; being the greatest and most magnificent instance of the representation of their features for the purpose of ornamenting by rudeness a new and totally-different kind of construction. We must, in neither case, allow the imposing effects to beguile us into a notion that the art is of the true kind. Columns and entablatures borrowed from Greek porticoes to be stuck against a Roman arcade are a fiction, without use or meaning; and consequently, though they may ornament, they do not decorate it, *i. e.*, render it decorous. In the same category are the arch moulding and spandril-work borrowed from Gothic masonry to be applied to beautify timber framing.

We see, then, as early as the fourteenth century, how representative design begins. Of course there are innumerable steps between the state of society that first necessitates it, and that which possesses nothing else and can produce nothing else; but, if disposed to condemn this anomaly in its latest and fullest manifestations, as a breach of common sense, we should trace it back through its various stages, and then we should see that our condemnation must, to be consistent, begin much earlier than many would be willing to allow.

The dimensions of Westminster Hall (see "*Westmininster Hall*") are, internally, 239 ft. by 68 (being the largest room in Europe without pillars, except that at Padua*), and 42 ft. high. The timber arches, however, spring from an internal cornice at only half this height; while on the other hand, the central part is left open to the collar beam, half way up the external planes of the roof, which occupy somewhat more height vertically than the walls themselves. Thus the upper *half* of this edifice is entirely of timber, and only the lower *fourth* is entirely of stone; the whole height being divided into four nearly equal parts, viz., from the floor to the commencement of the timber work, thence to the hammer-beams, or top of the stone-work, thence to the collar-beam, or top of the internal space, and thence to the ridge. The fine end windows extend through the second and third of these divisions; but the original side windows are confined to the second of them. The dormers (added preparatory to the coronation of George IV.) have greatly improved the chiaro-scuro, and would have improved it yet much more if placed higher. The obvious place for them was above the collar-beam. Their exterior, compared with that of the lantern (also modern and of cast iron), will show that *contrast* is not neglected.

The huge arch-buttresses to this structure, spreading to more than twice its own breadth, are a striking instance of costly sacrifice to the whims of representative design. They were yet insufficient, being placed only at each alternate truss; and the places of four on the east side, and one on the west, were supplied by other buildings of the palace, the removal of which has endangered this extraordinary work, and led to the substitution of slates for the original covering of lead. Its thrust, or dependence on lateral propping, must still almost equal that of a Gothic vault of the same dimensions. The west buttresses are now all inclosed in the buildings of the law courts, and of the three on the east only one ever stood isolated. The material of this grand structure is chestnut (from Normandy, as Sir C. Wren thought), the workmanship unrivalled for accuracy and perfection of moulded detail.

Guildhall, *King Street*, *Cheapside.*—This first architectural attempt of the Londoners was built by subscription, and begun in 1411. The roof being destroyed, with nearly the whole city, by the great fire of 1666, the interior was patched up by Wren, and again in the last century by Dance, who was permitted to add the present front, seemingly, like one or two later city architects, with a malicious intent to expose his worthy townsmen to ridicule.

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* The Paduan Hall is 240 ft. by 80. The comparison does not include clear spaces *between the pillars* of structures having them; for both halls would be excelled by the middle aisles of some Roman basilicas, by that of St. Peter's (which would contain them both, endwise), and by some modern ship-building sheds.

The finest part of this edifice is certainly the crypt, now a dark cellar, which has very elegant vaulting, with arches of the four-centred form, probably some of the earliest of that sort, which seems peculiar to this country, and has been commonly called the *Tudor* arch, though the time of its introduction would rather justify the term *Lancastrian* arch*.

With regard to the internal decoration of the hall itself, the chief if not sole model taken for imitation was evidently the nave of Winchester Cathedral, a very grand work, which, after many years' progress, was then lately finished. There is the same horizontal cornice, more large and prominent than is usual in Gothic buildings, the same boldness and largeness of feature in the "responders" (or wall-pillars), and the same kind of deep panelling, forming, between each pair of these responders, five vertical divisions, of which the three middle ones probably formed a window, though now in every case walled up. A cunning trick for effect is seen in the *transom* being placed a few inches *lower* in these three, than in the two lateral panels, so as to imitate, at the first glance, the effect of the former receding further than the latter (as they do at Winchester); and altogether, notwithstanding their strong resemblance in style, any one who sees both buildings cannot mistake which is the original, nor fail to perceive in the one a certain genuineness and delicacy that never entirely deserted the ecclesiastical Gothic; and in the other an air of coarseness and vulgar display, perhaps inseparable from the works of a busy commercial city. Yet it would be hardly possible to say what makes this difference.

The dimensions of this hall are 153 ft. by 48 ft. The ends were probably lowered and much altered, so that it is difficult now to say what was their original appearance, or how high was the roof, most likely a miniature of Westminster Hall. The buttresses, though very prominent, hardly seem sufficient for such a roof, with the excessive bulkiness of parts that would be required to harmonize with the bold internal decorations.

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* This ingenious refinement seems to have grown naturally out of the elaboration and exquisite finish which distinguished the English vaultings; for, notwithstanding our timidity in never attempting this art on a large scale, and our frequent disuse of it for the sake of the cheap gaudiness attainable in woodwork, yet this feature (elsewhere the most stationary part of the Gothic system) was with us the most steadily progressive, and by the end of the 14th century had reached a perfection and variety never attained by it on the Continent. Much wonder has lately been excited by the geometric skill shown in adjusting the invisible curves of Greek buildings, but great as it was, that shown in the English vaultings of the 14th century is greater. We may, without vanity, designate them the triumph of architecture; for though the aggregate merit of each production of this art may not always be quite proportional to the geometric knowledge and thought put forth, it is so in general. Everywhere, hitherto, the exaltation or debasement of this art and its professors seems to have been always proportional to their geometrical science and the importance they attached to it. Hence it is lamentable to see the neglect and even contempt of geometry displayed in the present architecture of England, which is now as singularly deficient on this point as it was formerly pre-eminent.

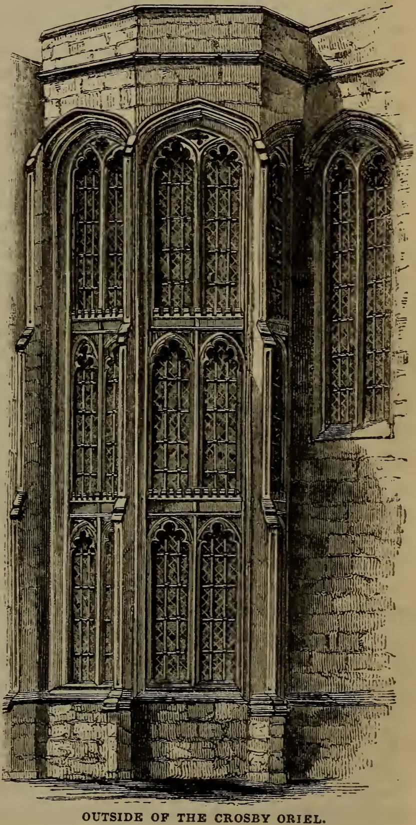
The panel-work round the dais is modern, and very poor. The monuments are on the orthodox principle, that every hero worth one at all, must excel all who preceded, and have a monument proportionally excelling theirs in *size* and *conspicuousness*, the only sure and ever ready and marketable modes of expressing importance. The two monstrous wooden figures called Gog and Magog have sprung up since the time of Stow, but when, how, or why, we have no record.

St. Bartholomew's the Less, or the chapel of St. Bartholomew's Hospital, retains (among a mass of contemptible pseudo-Gothic) one genuine and noble arch of the Lancastrian era.

The *Gateway to the inner ward of the Tower*, which has acquired the tragic name of "Bloody Tower," from the room over the archway being the traditional scene of the murder of the royal infants of Edward IV., must have been erected before that time, but how long the simplicity of the external features does not permit us to say. The gates are genuine, and the portcullis is said to be the only one remaining in England fit for use. The archway, by its slight curvature, angularity, and depth, forms a noble specimen of what may be called the Doric order of Gothic. For a prison entrance we know of no more perfect model. The vaulting within seems a later addition, and less artistic; but every detail being bold and strongly marked, without the intermixture of anything weak, thin, or shallow, there results that truth and consistency of expression which were then still considered necessary, these qualities not having been abandoned till almost our own times.

Crosby Place, Bishopsgate Street (immortalized by Shakspere as supposed residence of the infamous Richard), claims especial notice as the only remnant of the domestic architecture of Old London. It was built by Sir John Crosby, M.P., alderman and grocer, who obtained the ground on a lease of 99 years, in 1466, and is supposed to have finished the erection before 1470. The present age of course condemns the folly of a person building what he cannot wear out, and what is certain to yield as much or more profit to others after him; but it must be admitted that it was an amiable folly, and the inhabitants of most Italian and French cities owe some gratitude to those who were bitten with it. Though Englishmen at no time imbibed this spirit to nearly the same extent as the Venetians, or most other foreigners, still we were not without domestic architecture, and it reached its highest pitch about the time of Sir John Crosby.

The chief parts of this mansion surrounded three sides of a small deep quadrangle, open on the west end, to Bishopsgate Street, and having the whole east end occupied by the hall. The present remains consist of this hall (the ends of which, however, are modern); two rooms, one over the other, forming part of the north side; and extensive cellars under the whole mansion, covered with plain brick vaults, except that on the south side of the quadrangle, which has ribbed groining of stone. The hall (though some feet at each end are of modern design) retains its original proportions, viz., 54 ft. long, 27 ft. wide, and *forty* ft. high. Such was the sacrifice then thought worth making for majesty of proportion, though no sacrifice was made to "respectability," to symmetrical *regularity*, or to picturesque *irregularity*. This hall is lighted from both sides, near the ceiling, by Lancastrian arched windows, of singular beauty both externally and internally. We doubt if there be any specimen of domestic windows, in any style, more graceful, or more void of superfluities and affectations; and all the others in Crosby Place appear to have been similar, though rather shorter. The crowning beauty, however, is the vaulted semi-octagonal bay window, or oriel, as it is called. Its interior is one of the most perfect things domestic architecture ever produced; and the exterior, one of the best of its class, though disfigured by the atrophied representative buttresses at the corners.



OUTSIDE OF THE CROSBY ORIEL.

The two north rooms had a bay window of similar form and size, but different external appearance, owing to the intervention of a band of solid wall between the upper and lower lights, both of which, being governed by common sense, were arched, like the heads of all the other windows, the affectation of making the little arches of the lights support, or appear to support, a straight mass of wall, having not yet come into vogue. Both stories of this oriel were vaulted; and the window side of both upper and lower rooms is lightened, as well as decorated, by deep Gothic panelling, which, like everything in mediæval building (whether original or representative, decorous or nonsensical), rich or plain, is always *handsome;* because, prior to the rise in Europe of the principle of mechanical form-multiplying—of which brick-making was the first, and printing the most important instance—there was neither ready-made ornament nor ready-made design; for it was never imagined that anything could be decorative or decorous which was not *designed and made expressly for its place.* These rooms measure 42 ft. by 22 ft., and about 20 ft. high. The upper has, like the great hall, an oak ceiling, of a depressed Lancastrian arch form, rising partly into the roof, though not high enough to prevent the latter being properly tied. The ornaments of the small ceiling have been renovated in *papier maché*, but those of the great hall ceiling, being less delicate and on a much bolder scale, remain. The arch-like curves, dipping into three rows of pendants, are playful, and consistent with the festive character of the building; though the uselessness and falsehood of such appendages should banish them from the purer and more severely decorous architecture proper to public, and especially ecclesiastical, buildings.

The *Guard-chamber* of *Lambeth Palace* has a Gothicized roof, or rather roof-ceiling, of the simplest kind, and remarkable for its massive parts. It is probably of earlier date than Crosby Place, and seems to be an exact imitation of some extinct kind of stone roof. The same room has a Gothic (Lancastrian) window.

The *Gatehouse* at *Lambeth* was rebuilt in its present form by Cardinal Morton in 1490. Though in a debased style, the design of the gateway itself is worthy of notice. The external archways give no idea of the inner one, which is finely proportioned; and the interior has ribbed vaulting, a member which the mediæval builders seem never to have omitted in any situation where the surrounding walls afforded sufficient butment.

St. John's Gate, *Clerkenwell*, is, with the east window of the modernized church a little distant to the north-east, the only remnant of the great establishment of Knights' Hospitallers, who settled here in 1100, or some years before their rivals, the Templars. Their first hospital being burnt, was gradually rebuilt, and not finished till 1504. The present fragments cannot be referred to a much earlier date than this, as they have all the crabbed worn-out air of a very old and decrepid state of art. The gateway is not to be compared with that of the Bloody Tower, or even Lambeth; having, indeed, no beauty of proportion or detail; but the universal groining was not omitted.

The *Porch* of *St. Sepulchre*, opposite Newgate, marks the limit of the great fire in that direction, the church having been destroyed, but this fragment left. Its interior retains the original decorations, among which the vaulting, the forms of which seem correctly preserved in a plaster imitation, is remarkable as showing one of the first approaches towards a refined modification, peculiar to England and to the Yorkist and Tudor reigns, and commonly termed *fan* vaulting. The changes by which this was produced are similar in principle to those affecting the other Gothic features—abridgment of real labour, but increase of apparent elaboration; loss of real richness but gain of eye-catching fritter; abandonment of sculpture for carving, and of carving for mere mechanical stone-cutting. This is seen in the omission of the bosses, that in the earlier vaultings were so rich and yet so retiring as hardly to be noticed; and the substitution of a more glaring but infinitely less genuine ornament, the unmeaning arch-like panel heads, all alike, and only repeating in an absurd situation the forms that fill the walls and windows.

Henry the Seventh's Chapel.—Before describing this most gorgeous of mausolea, it may be as well to glance at the neighbouring series of royal sepulchres, and, indeed, all those in this abbey church, which exemplify the growth of that singular spirit of tomb-building rivalry, which finally reached its climax in this unparalleled manifestation. As the earlier tombs, though always adorned with architectural forms, hardly come under the term works of architecture, they have not been noticed in their chronological places, but left for the present, that objects so similar and closely connected might be all brought together.

The Royal Tombs.—The first is that erected by Henry III., the founder of the present church, to enshrine the remains of its former founder, the canonized King Edward the Confessor. This being the most venerated relic was placed in the most distinguished spot of the new edifice, viz., under the centre of convergence of the apsidal vaulting of the chancel. The whole of this apsis, or semi-oval termination, has its floor raised some feet above that of the surrounding aisles, and approached from the choir by a gradual ascent of steps, at wide intervals, at the head of which ascent stands a screen, made to form a back to the principal altar, and to part off the apsis (called "St. Edward's Chapel"); but low enough to allow a glimpse of the top of the shrine, on which the remains of that luminary were elevated, "as on a candlestick, to enlighten the church." We doubt if any temple of a sensuous worship, Pagan or Christian, afforded an instance of a more grand and imposing arrangement. This screen is now covered on both sides with elaborate fretwork of niches and canopies in the style of the 15th century; but it retains, on the inner or eastern side, a frieze of fourteen rude but deeply under-cut sculptures, representing events, real or legendary, in the life of the royal saint. It is almost the only English example of that beautiful species of monument, peculiar to an early and growing state of civilization, the historical frieze, in which picture-writing, almost superseded by letters, seems to put forth, in the last struggle, its utmost luxury and elaboration*.

To the weak partiality of Henry III. for foreigners, we owe some beautiful, though un-English, peculiarities of his church, its apsidal chapels, and its lofty proportions; but the same weakness appears disadvantageously in the three tombs he erected; one to his infant daughter, in the south aisle of the chancel, one to his sainted ancestor, and one to himself. These, being the work of an Italian, named Cavalini, exhibit no resemblance to the growing beauty of the early Gothic, but are in the irregular uncertain style then prevalent in Italy (called by some *Trecentine*), an undigested mixture of classic Arabian and Gothic features, overlaid with tawdry mosaics, which, however, have mostly disappeared from these monuments, by the depredations first of violence, and then of relic-hunting. The shrine of St. Edward has, above the stone portion, which is about 9 ft. high, an oaken addition representing two stories of Italian architecture, and was finished, it is said, by a miniature roof. The tomb of Henry himself resembles two structures piled one on the other, and is surmounted by his recumbent figure in brass, and above that, a flat and very plain wooden canopy, which was, no doubt, gaudily painted or gilt.

This occupies one of the seven inter-columns of the oval or horse-shoe-formed apsis, and the other six openings are filled by six later royal sepulchres, thus completing, with the screen above mentioned, the inclosure of St. Edward's Chapel. Taken in their chronological order, they well exhibit the regular progress in architectural luxury and false richness, and the no less regular decline in decorum, grace, and sculptural excellence. The first, that of the renowned Queen Eleanor, has its sides decorated with the heraldic insignia of the mourners; and as these required to be sunk in panels for their protection, the panels, &c., take forms of great beauty, not so much *adopted from* as *assimilated to* structural architecture, plainly for the sake of harmony therewith, not imitation thereof. The little pillars, blank arches, and hoods, may be said indeed to represent constructions that an object cut in solid stone does not possess; but on a larger scale it would require them; besides, they imitate no more closely than, in classic art, the pedestal imitates a building with plinth and eaves, or the balustrade a miniature colonnade. The principle cannot be called representative. The effigy (by Torelli, an Italian,) is considered the finest piece of mediæval sculpture in England. The tomb of her husband, on the other side of Henry the Third's, appears never to have been finished by his unfortunate son, and forms a hiatus in the series; but the next in date, that of Philippa, queen of Edward III.—in whose reign some have placed the culmination of English arts as well as arms—displays these manifest symptoms of decline; the figure has less simple dignity, and more attempt to supply its place by minute imitations of costume, and florid surrounding accessories, in which we have the absurdity of architectural forms laid on their backs; and in these, as well as those which decorate the sides of the tomb, we first find the overhanging niche-canopies representing arches and vaultings springing from nothing*. Edward the Third's own tomb is altogether a gorgeous composition; but here, in addition to the above instances of representative design, we first find mimic *buttresses*, those very defects which the early Gothicists had taken such pains to overcome in the form of these necessary members, being here wantonly introduced as ornament, though certainly with such a change as to diminish greatly their unsightliness. All the former royal tombs are surmounted by wooden canopies, with such finish and decoration of mouldings, &c., as was appropriate to their construction, and, in one case (Queen Eleanor's), extremely elegant; but here we have this feature elaborated to a degree that almost throws the tomb into insignificance. Yet, how is this enrichment effected? Only by disguising the real with a fictitious structure, covering it throughout with forms which would be beautiful indeed in the material for which they were invented (or any material possessed chiefly of compressile strength), and supported on appropriate pillars; but which, imitated in wood and hanging in the air, are false and absurd. In this mimic vaulting, however (which evidently afforded the model to that in St. Sepulchre's porch above noticed), we see, probably, the first hint both of the fanwork construction of vaults and the absurd arched panel mode of decorating them. The next sepulchre is that erected by Richard II. to his queen, Anne of Bohemia; and into which his own remains were afterwards removed. Being nearly cotemporary with the last, it has nothing remarkable but the brass effigies of the king and queen, disgracefully mutilated. Lastly, the mausoleum erected by (or in pursuance of the will of) Henry V., who left the most minute directions concerning it, fills the eastern or central arch of the apsis, and is the only one that (after the example set by some ambitious prelates in their own cathedrals) expands into a complete edifice, a miniature chapel, or *chantry* as it was called, with an altar and every requisite for the ecclesiastics appointed to say masses, for ever, for the soul of the deceased*. The tomb in this case stands under a richly-vaulted sort of gateway, flanked by two turrets of open fretwork containing winding stairs (the very unseen soffits of which are of fan vaulting) leading up to the chantry. This is a loft or gallery supported partly on the vaulting already mentioned, over the tomb, and partly on a continuation thereof eastward, across the ambulatory, or circular aisle, to the entrance of the Lady Chapel, now replaced by that of Henry VII. This loft is surrounded on all sides by screens of minutely-fretted niche and canopy work, that on the east now forming the extremity of the Abbey Church in that direction.

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* There is a much longer historical frieze surrounding the chapter-house at Salisbury, which in a length of about 150 ft. represented the Old Testament history, brought down as far as the passage of the Red Sea, but the earlier parts containing the creation are quite effaced. This was executed in the same reign, and probably about the same time, as the Westminster frieze.

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* The shields (one under each statuette, to describe whom it represented) had their bearings, not in relief, but in painting, which, having worn off, has afforded to modern builders a most valuable resource, the cheapest supposed *ornament*, for which precedent could be found, viz., *blank* shields! Blank ribands for inscriptions had a similar origin.

The chronological gaps occurring in this series are filled up by other monuments in the adjacent parts of the building, and we believe the following list contains *all* those possessing any Gothic architectural features. The dates are added as nearly as can be ascertained, and also the situations, which are all confined to the portions of the church lying east of the transept. The terms north and south *square* chapel, apply to those formed in the rentrant angles (marked H and O in the plan, page 148).

Gothic Tombs in Westminster Abbey Church.

1.	Aveline, daughter-in-law of Henry III.	1276	North side of chancel.
2.	Queen Eleanor	1291	North-east of apsis.
3.	William de Valence, half-brother to Henry III.	1296	South apsidal chapel.
4.	Two infants of Humphry Bohun. *Temp.* Edward I.		North apsidal chapel.
5.	Edmund Crouchback, son of Henry III., about	1300	North of chancel.
6.	King Edward I. (unfinished)	1307	North of apsis.
7.	Sebert (King of Essex, original founder of the Abbey), erected by the monks in	1308	South of chancel.
8.	Aymer de Valence	1323	North of chancel.
9.	John of Eltham, son of Edward II.	1334	South apsidal chapel.
	This had once a stone canopy on eight pillars, said to have excelled the beautiful ones of Aveline, Aymer, and even Crouchback.		
10.	Two infants of Edward III.	1340	South apsidal chapel.
11.	Queen Philippa	1369	South-east of apsis.
12.	King Edward III.	1377	South of apsis.
13.	Archbishop Langham	1379	South square chapel.
14.	King Richard II. and Queen	1394	South of apsis.
15.	Eleanor de Bohun, Duchess of Glocester	1399	South apsidal chapel.
16.	Sir Bernard Brocas	1400	Ditto.
17.	Abbot William of Colchester	1420	North apsidal chapel.
18.	King Henry V.	1422	East of apsis.
19.	Philippa, Duchess of York	1431	South-east apsidal chapel.
20.	Lord Bourchier, standard bearer to Henry V.	1431	North-east apsidal chapel.
21.	Bishop Dudley or Sutton	1483	South-east apsidal chapel.
22.	Sir Thomas Vaughan, treasurer to Edward IV.		North apsidal chapel.
23.	Abbot Fascet	1500	Ditto.
24.	Bishop Ruthall	1522	Ditto.
25.	Abbot Islyp.	1532	North square chapel.

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* This extravagant system seems to have begun with Bishop Edyngdon, who died in 1366, at Winchester, which cathedral contains no less than *eight* of these monuments of overgrown vanity and superstition, each excelling the last in costly magnificence, one erected by each bishop that occupied the see from that time down to the Reformation.

The tomb of Islyp is destroyed, but his chantry is remarkable for its fine vaulting, and curious rebuses expressing his name (an *eye*, with a *slip* for planting, and a boy slipping out of a tree). Some attribute to this abbot the design of Henry the Seventh's Chapel, while others divide that honour between the King and Bishop Alcock, of Ely; Bishop Fox, of Winchester (both of whom erected most gorgeous chantries in their own cathedrals); or, lastly, with Sir Reginald Bray, whose name is most commonly associated with it; but the will of Henry VII. expressly mentions as "master of the works" the prior of St. Bartholomew's, whose name was William Bolton, and is known to have been a famous builder. The statement, however, that the king or his architects imported these forms "of more curious and exquisite building" from France is without foundation, for the Continent affords no instance of the fan-vaulting, or any other of the peculiar subtleties of this extraordinary work; all of which grew naturally out of ideas which the florid Gothic of England, and of no other country, had latterly developed.

Determining to outvie not only his royal predecessors, but all tomb-builders, lay or clerical, and English or foreign, in the splendour of his monumental chapel and its endowment, Henry VII. pulled down the Lady Chapel (the easternmost part of the church, and that first rebuilt in the pointed style), to replace it by this larger erection, which he began in January, 1503, and left directions for finishing. But the building itself, exclusive of the tomb and internal fittings, appears to have been completed before his decease. The plan of the chapel is neither complex nor unusual, a simple central avenue terminating eastward in five sides of an octagon, and flanked by lower aisles, which would continue round this octagon apsis, did not six solid wedge-shaped masses divide this curved portion of the aisle into five square recesses, or chapels, as they are called, open to the central apsis, but not to each other or the side aisles. The outer buttresses take the form of octagon turrets, and are continued nearly as high as the central building, terminating in clusters of niches and great pear-shaped pinnacles. These weighty masses obviate the necessity for an outward extension of the feet of the buttresses. The flying buttresses to prop the central vaulting are double, the upper and lower of each pair being connected by open tracery of circles, at once graceful and structurally true. These features alone would give an extraordinary intricacy to the upper part of the fabric, which is prodigiously augmented by covering every part with panelling. But what makes the unparalleled fritter of the exterior, is the replacement of the usual aisle windows by a sort of glazed screen broken into angles something like the plan of a modern fortification, and borrowed from the most fanciful kinds of oriels used in the domestic architecture of that time. With the octagon buttresses and the zigzag curtains connecting them, the outer inclosure is broken into about 160 parts, no two adjacent ones in the same plane.

The puerility of this freak (which might be proper enough to obviate flatness in a greenhouse or an iron building) is contrasted by the simple grandeur of the upper story, which has common-sense windows of a tall and elegant form, and with hardly any of the perpendicular mannerism in their tracery. The mass of work above them serves a double purpose; to fortify, by its load, the pillars against the inward thrust of the aisle vaultings; and to afford headway between the main vault and the roof, which is very properly of a low pitch, for nothing could be more incongruous than a vast surface of plain roof, with its massive unbroken form, over the weak and delicate features of the late Gothic, even when interspersed with plain wall.

The whole exterior of this edifice was renovated at the public expense, between 1809 and 1822. The cost, in the softest stone obtainable (which is unfortunately already perishing), was £42,000. The original forms are said to be strictly preserved; but this certainly cannot be the case with the upper parapet and pinnacles, which betray such extreme poverty of thought as never was tolerated by mediæval builders.

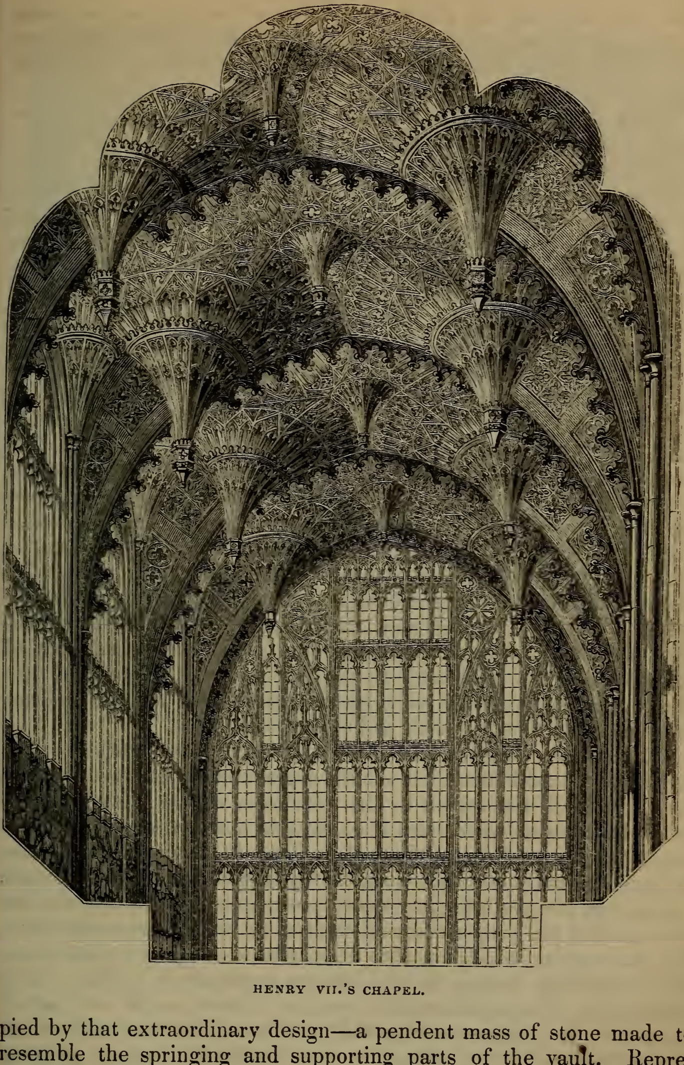
The interior does not disappoint, as is too often the case, the expectations raised by a highly-enriched exterior, but keeps that predominance over it in quantity of ornament which it always should keep. This more ornate character is obtained, not as usual, by its having less plain surface (for neither exterior nor interior has any surface not broken up with ribs and panels), but by the substitution, in many places, of carving for architectural forms, and sculpture for carving. The building is said to have contained 3000 full-length statues and statuettes, besides the cherubs and animal figures with which there is "no jutty, frieze, buttress, nor coign of vantage" but seems alive. Nor is this sculpture much more remarkable for quantity than quality, for that art seems to have attained with us a second meridian about the time of the expiring Gothic; and though the general mass of it found in rural buildings of this era displays a most depraved taste in those who suffered churches to be profaned with such trash, yet the specimens in this chapel, and that at Warwick, show that the immense demand did call up artists (most probably Italians), hardly inferior to those of the Edwardian era, though the style is far more artificial. Ranks of statues of saints, in close array, supported by cornices of angels equally crowded, line each of the five recesses round the apsis, and supply the place of a triforium round the whole interior. But the luxury of the English after-Gothic is most singularly displayed in the vaulting, which, in foreign buildings of this degree of enrichment, presents an incongruous baldness, but here a splendour altogether similar, in degree and *kind*, to that of the other parts. The eastern recesses present fan-work in its simplest form, though varied by a small central piece of flat ceiling, which is unnecessary and structurally false. In the side aisles, this central portion of each compartment is chiefly occuwith the very grave one of ill-distributed light. Nothing can atone for the fact that the dome, which ought to be the lightest, is the darkest part of the interior; an effect now sadly exaggerated by the lower parts having been cleaned, while all above the central circular cornice remains lined with dust and smoke, a dark undistinguishable cavity. The defect, however, is radical and irremediable; and it seems to us that its avoidance would have been worth any sacrifice of external beauty. So, indeed, the architects of St. Peter's and its dormer windows evidently thought. The only remedy, if any, would be some arrangement of reflectors; and if the windows of the rest of the edifice were deeply coloured, as in the early Gothic churches, perhaps the due proportion of light between the dome and other parts might be obtained.

The technical defects of the interior exceed those of the exterior; and perhaps the greatest of them is the eking out the height of each pilaster by an ugly isolated bit of entablature, which is the more inexcusable from the number of ways in which it might easily have been avoided. With regard to the attic that takes the place of the Gothic triforium, it is doubtful whether its 19 feet adds anything to the effective height, which appears much the same as if the vaults sprung at once from the entablature. Of the two orders (that continue intermixed in the Palladian manner throughout), it is to be regretted that the principal is every way more enriched than the subordinate one; its pilasters being fluted and its mouldings carved, neither of which ornaments is possessed by the smaller order. This is directly contrary to the general practice of the Italian architects, founded on nature, which always bestows most ornament on the subordinate and weaker parts. The treatment of these two orders should have been just reversed, except the entablature of the small order, which is meanly and disproportionately small. The few columns used near the west end give an idea of the enchanting effects that would have resulted from an occasional use of such members (in the small order) elsewhere, as is done throughout St. Peter's. The four extremities of the interior are its finest parts. In the portion under the dome, the four segmental arches are obviously an after insertion, probably on account of some symptom of unequal settlement observed in one of the arches over them. Their introduction must ever be regretted, as a blemish to the integrity of the most important part of the edifice, apparently useless, and really useless to the equilibrium of the work *as designed;* consequently betraying a discrepancy between design and execution. The meeting and interpenetration of the mouldings of the eight main arches has been censured quite enough for so unimportant a point of detail. No one has shown how it could be avoided (retaining the present ground-plan) without introducing greater evils; and we are tempted to think it one of the *very* few points escaping Wren's notice till after the foundations were laid.

The great architect had prepared schemes for consistently decorating the bare surfaces, at least of the vaultings, if not of other parts; and the inner dome was to glow with the perennial freshness of mosaic painting, for which has been substituted stage scenery, appropriately inclosing the wretched counterfeit sculpture of Sir James Thornhill, both now happily unintelligible, from smoke and damp. The house or theatre painters seem to have taken possession of the chancel and apsis.

The exterior of this fabric, no less than that of its Italian rival, is remarkable (as seen from its immediate vicinity) for deceptive smallness. Few spectators from the surrounding roads would believe the dimensions of any part, if stated to them. This defect (which some by singular sophistry have tried to prove a beauty) arises here chiefly from the want of a scale, owing to the fence preventing our seeing any human figures near the foot of the building, or even judging of the distance that separates us from it. The hiding of this space, and giving us scale-objects only close at hand, amounts to the furnishing of a *false* scale; and it is difficult to conceive any contrivance more effectual for diminishing the building, unless it be a concave lens. An equally injurious addition, however, was made by the puppy who supplanted Wren in the last few years of his long life (see *Architects*, *Wren*). A late writer on architecture has said, regarding the effect of scale or no scale on works of nature or art, that "it takes very little to humble a mountain. A hut will do it sometimes." It takes still less to humble a cathedral, and this little, Wren's contemptible successor contrived to add, in his mock balustrade over the second cornice; a thing protested against by Wren without seeing it — how much more had he seen its barbarous design!—and, what is worse, a thing studiously contrived to give a false scale; for this is one of the very few architectural features (perhaps the only one), whose use requires a limited and almost invariable dimension, and it is therefore taken by every eye as a perfectly safe measure or scale. We know that a balustrade is meant to lean upon, and therefore, wherever we see one, we conclude it to be about 3 or 4 ft. high. A *mock* balustrade, *nine* feet high, never enters our calculations, so that when we see such an absurdity, on a building 90 ft. high, if we have other scales we are simply puzzled, but if, as in this case, we have *none*, the building is at once reduced to 30 or 40 ft. Hence it happens that the west front of St. Paul's is the only part whose magnitude has a chance of being appreciated; and here we have actually no scale at all, true or false; no balustrade, no living figures, and not only the foreground, but the flight of steps (the only scale-object the front itself contains), shut out from view by the fence.

St. Stephen's, *Walbrook*, is considered the most original and beautiful of the fifty parochial churches rebuilt by Wren in consequence of the same immense fire. In many, perhaps most, of these structures, the doggedness of the authorities confined him rigidly to the



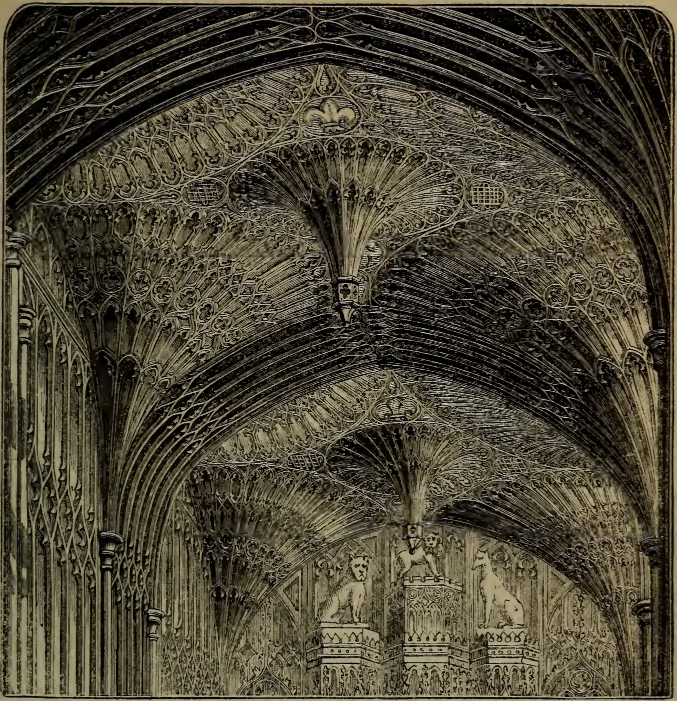
HENRY VII.'S CHAPEL.

pied by that extraordinary design—a pendent mass of stone made to resemble the springing and supporting parts of the vault. Representations of these parts (supposed to indicate *richness* of fancy) are by some critics condemned; nevertheless, the effect is most enchanting, and the beauty of its workmanship is of such extreme richness that the mind is filled with amazement and delight by the solidity and permanency of its ornamentation. Its unique and bold style are evidences of the determination of its architect to avoid imitation in the execution of his task (see our illustrations in pages 169 and 171, both drawn with exactness and engraved in wood with fidelity).

These lower vaultings, however, betray the fact, that the embayed and zigzag outer inclosures are an afterthought, for the vaulting is in no way adjusted to them, but terminates in a single arch, spanning from buttress to buttress; and its edge (by having no greater prominence than the other ribs) gives an unfinished appearance. The great, or clere-story vaulting, consists of a most ingenious combination of arches and arch-work, in which the compressile principle of building reaches the utmost elaboration and refinement it ever attained; and of which there are only two other examples (both much less ornate), erected about the same time as this, in the Cathedral and Divinity-School at Oxford. This may may be said to be a final triumph of architectural science.

The fittings of this building, and the tomb, by the celebrated Torrigiano, were added pursuant to the will of the founder. It has been conjectured that the celebrated Benevenuto Cellini executed some of the finest of this work, but this being doubtful we do not give it as a fact. The screen of brass surrounding it is a most unique work, and was intended to enclose the chantry, in which prayers were to be offered on behalf of the deceased "*for ever.*" Unequalled monument of human shortsightedness! He knew not that this whole overgrown system, accumulated for ages, was now ripe to its fall. He little thought in how few years the growing enlightenment of the land, and the selfishness of his own son, would sweep off this whole vast machinery, for ever silence the masses, and leave these gorgeous aisles a gazing-stock and a glorious wonder.

St. Stephen's Cloisters and *Oratory*, *Westminster Palace.*—This portion of the old Palace (lying in the angle between St. Stephen's and the Great Hall) was rebuilt by the "Defender of the Faith" himself, before his momentous troubles of conscience, and is, therefore, the last fragment of splendid ecclesiastical building in England. It is also the last decidedly decorative work that is unmixed with Italian details (which had already been introduced pretty extensively), and the last that contains the great structural essential of the Gothic architecture, viz., the vaulting, which has ever since been so completely abandoned, that everything relating to it is become practically a lost art. This is indeed, at present, a fortunate loss, as it preserves this one part of the ancient buildings—incomparably their most important and varied part, as regards either science or taste—from the present grievous "restoration," a more ruthless catastrophe than any that befel them under the Tudor tyrant, the Roundheads, or the churchwarden beautifiers. Parsimony or inability precludes our restorers from touching this main feature, and thus leads us to hope, that when the storm has done its worst, though all the rest of these precious me-



HENRY VII.'S CHAPEL.

mentos be worse than destroyed—falsified, and made a forgery—the vaultings and their carved bosses will remain genuine.

The St. Stephen's cloisters are on a very minute scale, but on the usual plan, surrounding a square court, and are remarkable for having had two stories, of which the lower only was vaulted. The windows and their mouldings occupy the whole of each inter-buttress, so as to admit all the light possible, and hence the upper ones have each light carried up to reach the flat ceiling, and no general arch spanning from buttress to buttress to relieve the minor arches over the lights. There being no mass of wall to support, this construction is here fit and beautiful; not so in other cases, where this "Tudor" window is evidently used merely as the cheapest means of retaining those Gothic peculiarities that had come to be considered essential to gentility; and where the necessity for a concealed arch (often in ancient and always in modern instances) renders the whole affair a masque and a deception. The vaulting of the lower cloister presents four beautiful varieties. That of the west side, which was the most frequented as a corridor of communication, is the richest; that of the north and south rather plainer; and that of the east the plainest. These three modifications are all on the fan-work principle; but in the four corner compartments of the arcade a fourth design is used, similar in decorative style, but applied to an earlier form of vault, having greater appearance of strength. From the middle of the western arcade, between two of the immense isolated buttresses of Westminster Hall, a minute chapel or oratory projects into the centre of the quadrangle, and terminates in a semi-octagon apsis. It is divided into two stories, whose windows and decorations correspond to those of the upper and lower cloisters, the lower only having vaulting and arched windows; and this forms, perhaps, the most complete architectural morceau ever compressed into so small a space. The whole design of this quadrangle (which we should be inclined to ascribe to Abbot Islyp) is a marvel of good taste for the age of its erection, being far more chaste and decorous than that of either Henry the Seventh's Chapel or those at Windsor and Cambridge.

The Stalls of Henry the Seventh's Chapel, which, from their luxuriance of fancy, have a foreign air, form our latest effort in Gothic wood-work; and it will be observed, that this art never, even at so late a period, descended to that exclusively representative character which we remarked in the modern wood-work of the Temple Church, or anything approaching it. For here the artist, though borrowing many or most of his *details*, or rather the hints of them, from stone architecture, freely modifies, lightens, and varies them, and is as far as possible from being reduced to the most prosaic and starved expedient of making the *whole* (as a whole) representative, *i. e.*, reducing it to a series of models of stone building. It took three centuries more to bring us down to that depth of inventive pauperism, and to give us, in a mock-Early-English "restoration," furniture whose details indeed may be Early English, but the governing principles and character more perfectly opposed to everything Early, than the latest Tudor, the Anglo-classic, or even the modern joiner's style.

St. Peter's in the Tower, the *Savoy Chapel*, near Somerset House, *St. Helen's*, and *St. Ethelburga's*, near Crosby Hall, and the parish churches of *Lambeth*, *St. Giles Cripplegate*, *St. Olave Hart Street*, and *Allhallows Barking*, in Tower Street, contain remnants of the building fashion (for it cannot be called an architectural style) applied to the meaner buildings of the Tudor age. At this period all variety and invention was confined to works of regal splendour and luxury. Other structures, as those above mentioned, present only certain starved and withered vestiges of the Gothic system, now reduced, like the architecture of Roman Egypt, or of modern China, to a mere routine or fashion—a regulated costume for all buildings pretending to respectability, but having as little reference to beauty or design as the hat or coat of our present costume. It is curious to compare this effête state of art with the nascent art of the eleventh or twelfth century, as displayed in the White Tower Chapel, or St. Bartholomew's. If poverty be a characteristic of both phases, what different kinds of poverty! Meanness belongs only to the latter phase; for though both may be poor and feeble, only the latter is impoverished or enfeebled. It is impossible to mistake between the feebleness of infancy and that of dotage. The indescribable freshness and suggestiveness of a young and growing art, and the directly opposite qualities—the worn crabbed mannerism, graceless grotesqueness, and lean decrepitude—of an old and perishing one, must, we think, when brought into contrast, strike every spectator, however ignorant of technicalities; and it would be easy, both in the architecture of the ancient world, and in that of the mediæval Church, to distinguish at least "seven ages" by the mere gradations of character between these two extremes*.

St. Andrew Undershaft, Leadenhall Street, is a large specimen of the latest Tudor fashion (about 1540), less known than it deserves to be, if we regard only the fact of its being perhaps the very *first* church erected with a view to the Protestant worship. Though everything ornamental bears the melancholy impress of an effete system, and points evidently to a past beauty, of which it retains the feeble remnants, pared down to the extreme of niggardliness, yet there is common sense and judgment in the innovations made to suit the new ritual. The deep stage-like vista called the chancel, which would withdraw the minister during an important part of the service as far as possible from his hearers, is omitted; the pillars reduced to the smallest practicable size; the arches throughout so depressed as to harmonize with the flat forms of the ceilings; the whole plan made less oblong than the mediæval churches, and plainly tending more towards the form and proportions of the early Christian basilicas; a class of buildings which it also resembles unfortunately in other par-

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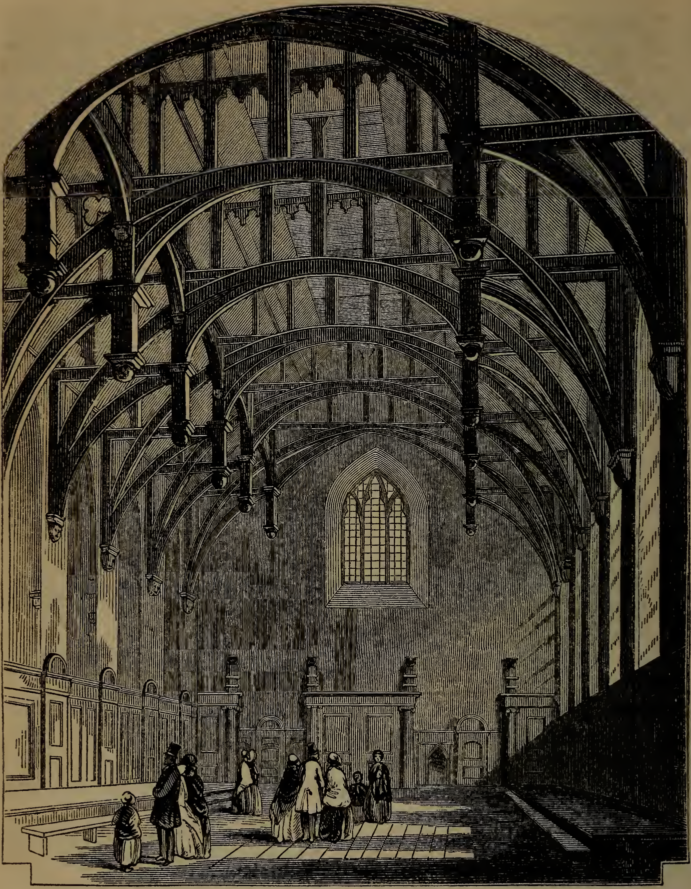
* A comparison between the styles of ancient and of mediæval architecture will show a decided correspondence between the four chief periods; the infancy, youth, decline, and senility of each:—

Styles of ancient building.	Styles of mediæval building.	English exemplifications of the latter.
1. EGYPTIAN, PELASGIC, &c.	1. MILLENNIAL	Saxon—Norman. Semi-Norman.
2. GREEK	2. ORIGINAL GOTHIC	Early English. Early Edwardian.
3. ROMAN	3. REPRESENTATIVE GOTHIC	Late Edwardian. Ricardian.
4. ROMANESQUE	4. GOTHICESQUE	Lancastrian. Yorkish—Tudor.

The characteristics of the *first* period, in each case, are rudeness, uncertain or unmethodical ornamentation, monotony in general design, and total absence of disguises; of the *second* period, increasing decorum, consistency, and method, together with exquisite finish, and the highest art, without pretence; of the *third*, a tendency to save thought by compendious methods, and to seek striking effect rather than prolonged satisfaction; of the *fourth*, increasing sameness in detail, quaintness, mannerism, and uncertain graceless proportions.



HALL OF LAMBETH PALACE.

ticulars, its taste and artistic character bearing about that relation to the Gothic system of art which those buildings bear to the classic.

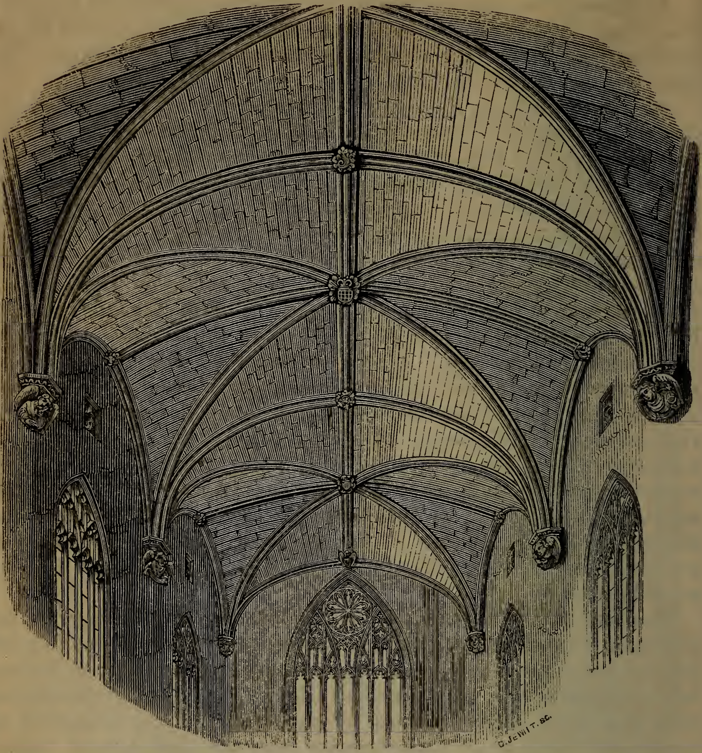
The great *Hall* of the *Middle Temple* (see "Halls" for one illustration), and that of *Lambeth Palace*, as above represented, are curious examples of the Westminster Hall form of roof, dressed in Italian instead of Gothic details. The Middle Temple Hall was built in 1572. It omits the principal arched rib, and multiplies the pendents and smaller curves. An old writer says it "is very scientifically constructed, and contains a vast quantity of timber." The Lambeth roof was not constructed till about 1662, by Archbishop Juxon, who left directions to have it finished in the "old style," which it is as regards general form, and absence of ceilings.

Northumberland House, Charing Cross, is an example of the ultimate state of our degraded indigenous architecture at the time of its disappearance before the classic importations of Inigo Jones. Its front was commenced in 1605.

St. Catherine Cree, Leadenhall Street, dates from the reign of James I., when the Italian fashion, already paramount in secular buildings, had just begun to invade churches; or rather when churches began again to be built, after nearly a century in which none were erected. With far more conceit and pretension than St. Andrew's, it has far less truth, and therefore less beauty. The windows are a sacrifice of every other quality to novelty, and remind one of the neighbouring Coal Exchange. The ceiling is perhaps the first example of a sham vaulting; the first example of our builders condescending to a direct lie as to the material of which their work is composed. It is the parent of our grained paint and jointed stucco, and all the tissue of falsehoods that make up the sum total of modern English building decoration—deceits that deceive nobody—ornaments that adorn nothing, and please nobody—that, it has been truly said, never attract or fix an eye except painfully; and for which, no one pretends even to allege any reason but fashion; or (the incendiary's reason for burning ricks), that they "give employment," that is, occupy and render useless a swarm of busy drones, who would otherwise have to learn and do something useful.

The introduction of direct physical falsehoods, may be regarded as the main distinction between the second and the third periods of English architecture; for the change of fashion from Gothic to Italian was comparatively a mere accident, though, being contemporaneous with this most decided change of principle, it forms altogether a convenient point of division between the first and second stages of representative design. This new period commences with the works of Inigo Jones.

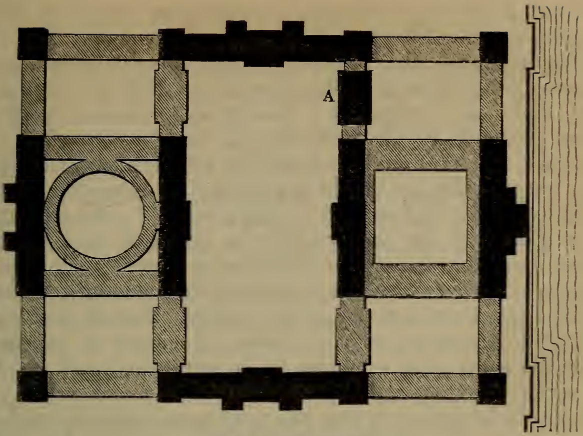
Lincoln's Inn Chapel, though not the earliest work in London by this master, is the only one in which he imitated (by the desire of his employers) the old national style. The interior, which is esteemed for its glass painting, has been so altered by the addition of a later ceiling (see illustration page 176) and end windows, that it cannot be viewed as Jones's work; but the side elevation of the exterior plainly partakes of the boldness, stateliness, and harmony of his other designs; and though the petty exactness of later imitators may yet find it convenient to make faults of every variation from precedent in the details, this fragment has some rare qualities. We know of no *mediæval* work even, in which apertures of so low and broad a proportion produce, as here, no ungraceful or mean effect; and though most of the works of this scenic architect differ from his masques only in being composed of more durable materials, there is an uncommon verisimilitude arising from



LINCOLN'S INN CHAPEL.

every deception being carried out as if it were a reality. Thus the buttresses here are as prominent and massive as if they sustained a real vaulting. To this, and the concavity of their outline, seems due much of the stately effect of this building.

The *Banqueting House, Whitehall* (now used for a chapel), was the first structure from which all vestiges of Gothic forms were banished by the imported Italian taste, and is the chief work erected by Inigo Jones in London, though a very small portion of the vast palace projected by him and his patron James I. This will appear by the annexed block-plan, in which A represents the fragment executed. Of the remainder, no portion would have been lower than the present, while the parts shaded dark would have been higher by an entire order of columns, so that the imposing fronts of this building would have sunk almost into insignificance in the vast design. The extent of the northern and southern fronts was to



PLAN OF WHITEHALL.

be 1152 ft., and that of the eastern (on a river terrace) and the western, towards St. James's Park, each 874 ft. Of the seven inclosed courts, the smallest would have equalled in grandeur anything of the kind now existing; while the largest, 740 ft. by 378 ft., and the circular one (surrounded by two stories of arcades, faced by colossal Persian and caryatid figures), would each have produced effects that modern architecture has never reached, hardly perhaps ever projected. The design of Whitehall is indeed the most stupendous for a secular building that has ever been actually commenced, at least since the times of the Cæsars; and, by excelling, in every respect, both Versailles and the Louvre, the Caserta and Escurial, it would have reversed the taunt that English sovereigns are the worst lodged in Europe. The variety, without breach of unity, that pervades the numerous fronts, external and internal, of this wonderful design, the well-studied adaptation of each to its aspect and light, together with the noble boldness, and total absence of petty breaks and divisions, are qualities that distinguish this greatest, but at the same time most un-English, of our architects, from all his successors; and it seems marvellous that a work so generally in their hands, should have had so little effect on the national taste, which is chiefly distinguished by qualities exactly the reverse of those in which he excelled.

Whitehall was to have replaced an older palace built by Henry VIII., and was commenced in 1618, by the erection of the present apartment. Charles I. (who afterwards entered the scaffold from one of its windows) had its ceiling painted by Rubens, with mythic compositions representing the apotheosis of his father, which have been retouched by Cipriani, but are now again too obscure to offend by their extreme unfitness to the place. The other portions of the Tudor palace remained till they were destroyed by two fires in

1691, 98. In Queen Anne's reign, it was again proposed to carry out the superb design. The ruins of the old work remaining, "for want of rebuilding the same, Mr. Weedon, an ingenious gentleman, supposed the city of Westminster was dammified above £30 *per cent.* in their houses, trades, and properties. The same gentleman, therefore, of his own good will, to the reforming that most noble palace, for the honour and benefit of the queen and her kingdom, proposed in print, that an act of parliament should be made for the rebuilding of it, after the manner of a model or plan of Inigo Jones."* He estimated the cost at £600,000, for raising which he proposed various means—the first was, "that the city of Westminster should be incorporated, to consist of a mayor, recorder, and twenty-four aldermen, and certain franchises and liberties to be granted them. That all profits arising to the said corporation, over and above all manner of expenses and charges the corporation would be at in supporting itself, be, for the next seven years, appropriated to carry on the said palace. That duties should be laid upon new improved rents within the said city of Westminster. That all officers that held two or more offices of above the value of £300 *per annum*, should pay so much in the pound. And that such as had any right or title to any house, or office, or lodging, within the said new intended palace, should pay likewise so much in the pound. That all improvements of any part of the ground of Whitehall, and the benefit arising to her Majesty of all future and new inventions, discoveries, and improvements, be for such a term appointed towards the said charge. And that all future forfeitures accruing to her Majesty, for a term of years, be likewise appropriated for the same charge; but this work was thought fit to be laid aside for the present." This is to regretted, when we consider that all those public offices now scattered about, some under the grotesque chimney-pots of the half-built Somerset House; some on the disjointed row of fragments of buildings facing the present (and occupying part of the site of the intended) Whitehall itself; some in rickety combustible builders' speculation hovels, about the neighbourhood; and all ever craving more accommodation; would all have had ample room in this building, of which any nation might be proud, instead of hiding in holes of which any one would be ashamed. Of the *economy* of Weedon's plan, compared with the present, there can be no doubt; and this renders it perhaps not altogether hopeless that the design of the "British Solomon," and the British Hiram may even yet, at some future period (like that of the Cologne fane, after its slumber of centuries), be revived.

St. Paul's Church, *Covent Garden*, though twice almost rebuilt, retains the east front as in the original work, designed by Jones for the Duke of Bedford, who wished to erect for his tenants a church, but one "not much better than a barn." He accordingly endeavoured to embody Vitruvius's description of the Tuscan temples, and this portico is remarkable as being the only attempt closely to follow that account. It was extravagantly praised for a long time after its erection, as it might well be by those who had never seen another portico, and whose ideas of splendour in building were derived from such works as Henry the Seventh's Chapel; of simplicity, from such as St. Andrew Undershaft. The letters of Goethe present a striking instance of the impression produced by any classic architecture on those so circumstanced. The broad unbroken surfaces and deep shadows of this porch are still striking, though much loss of grandeur arises from the too great diminution and entasis of the columns, and especially of the antæ, or pilasters. The portico and doorway were not originally a sham, and the reason for making them so is to us involved in mystery. It seems that the mediæval custom, or ceremony of praying towards the east, led to the placing churches, when in an open site (as all, perhaps, in this country were when built), with their chancel in that direction. This did not, however, in foreign countries at *any* time, nor *here* for long after the Reformation, supersede either the common-sense rule that the entrance should be as near the street or road as may be convenient, or that the sanctuary should be removed from the entrance. But, at present, this orientation is considered a point of such vital importance that it requires not only these rules to be frequently violated; but even (as in this case) a whole church, if it have the misfortune to look the wrong way, must be turned round, and its ostensible entrance made into a bit of scenery.

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* Seymour's "Survey of London and Westminster," 1735.

The houses with arcades lining part of the *piazza* before or behind this church, were intended by Jones to be continued round that quadrangle, which would then (not being blocked up by market sheds) have resembled those of many Italian towns. He thus introduced the *squares* of modern London, and laid out, besides this, the largest of them, called *Lincoln's Inn Fields*, in which are some slight vestiges of his architecture, or rather of the influence it exerted on the successive rebuilders. The only other conspicuous remnant of his works in London is the water-gate to an intended mansion, now called *York Stairs*, east of Hungerford Bridge—a very graceful and appropriate morceau.

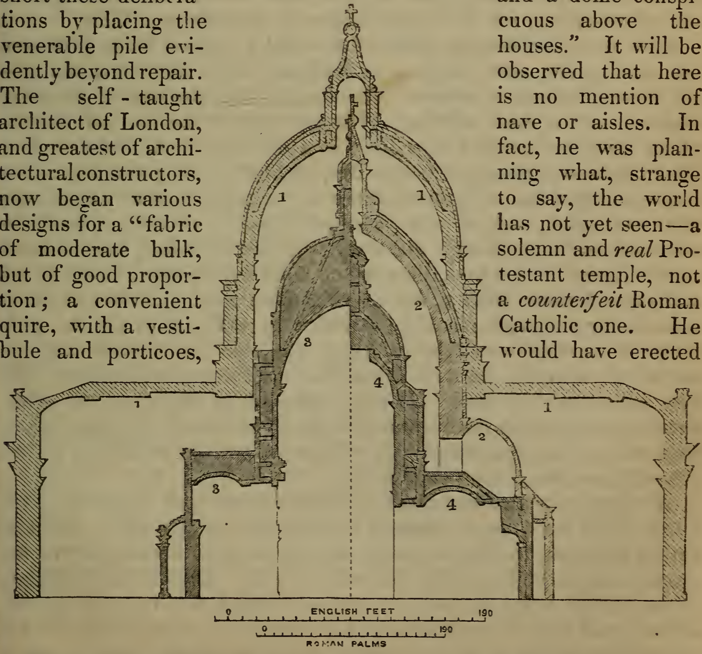
Greenwich Hospital, for naval pensioners, on the south bank of the Thames, four miles below London Bridge, is considered the most sumptuous building ever devoted to a charitable purpose; which is nothing remarkable when we know that it was designed for no such purpose, but for a palace of the luxurious Stuarts. Its conversion into a hospital by William and Mary, in 1694, was a happy mode of disposing of an unfinished and cast-off palace; but to render this piece of liberality complete, we cannot but think that it should either have been left in its half-built state, or carried on upon the original design. An unfinished and abandoned building cannot give such an impression of meanness, as one broken off during its erection and then eked out to the full dimensions with niggardly make-shifts, which (occupying the site of what was intended) prevent its completion, and not only proclaim its abandonment, but seem to embody the sentiment "as *we* cannot finish this work, we will take care that nobody else shall."

When we consider the entire dependence of every great work of this class on the caprice of successive rulers, we shall think it much more remarkable that every royal family, except that of England, should have been able to begin and finish a palace (and in some cases more than one), than that English sovereigns should have not yet achieved such a work. Greenwich is the attempt that most nearly reached realization; and, as seen from the river, in some positions, the patchwork is out of sight, and the group becomes the most complete architectural scene we possess. The two northern masses of building are from a design of Jones, though the first was not erected till after his death, by his pupil and son-in-law Webb; and the other not till Queen Anne's reign; after whom it is named. The older (or King Charles's) building was partly rebuilt in 1811–14, and distinguished by sculpture of artificial stone in the pediment. The two southern masses are chiefly from a design of our second great architect, Sir Christopher Wren, and were commenced by William and Mary, whose names they respectively bear; but their construction proceeding slowly, successive periods have left the melancholy marks of steadily declining taste and increasing parsimony; that which begins in Portland stone and Corinthian splendour, sinking at length into mean brickwork, or unable to afford in inferior stone the most ordinary degree of finish. The design of the brick portions is in the most corrupt taste of Vanbrugh, but whatever is visible from the centre of the group is by Jones or Wren. The inferiority of the latter is obvious in the comparative want of repose, and greater crowding and flutter of small and multiplied parts. The two pyramidising masses crowned by domes are finely placed, and quite characteristic of his style, as is also the coupling of columns in the colonnades. There is nothing so majestic as either the inward or river elevations of Jones's work, but more picturesqueness and variety. The two not only show the distinction between the tastes of these masters, but also exemplify, in some measure, that between the Roman and Venetian schools of modern architecture, the northern buildings having some resemblance to the former; though, in general, both our great architects were followers of the latter.

The chief dimensions of the exterior are:—the northern buildings each 175 ft. by 290 ft.; the space between them 290 ft. square; the southern buildings each 205 ft. by 277 ft., exclusive of the attached colonnades, which project 19 ft. The avenue between is 115 ft. wide, and the inner court of each of Wren's buildings 188 ft. by 150 ft. The general height of the buildings 65 ft., and of the domes 130 ft. The hall and chapel originally both resembled in arrangement the hall at present, which, but for its painted sham architecture, would be the fitter chapel of the two, being the more solemn and finely-proportioned room. The remodelling of the chapel with Grecian details was the work of James Stuart, the Athenian antiquary, 1780–90.

St. Paul's Cathedral.—At length we are refreshed by the sight of an edifice *finished*, at least as far as regards substantial parts, though remaining without any of the numerous decorations for which its interior presents so splendid a field; and which the spirit that erected the structures which it emulates, would have continued to add and superadd, instead of thinking its office ceased when the last stone was laid. Commonly classed as the second of Christian temples, this cathedral is really the *first* in completeness, unity of design, and solidity of construction; only the *fifth* in extent or capacity (being excelled by St. Peter's, Florence, Milan, and Amiens); and about the *last* in richness and variety of ornaments.

The old cathedral having been patched in every style, and a plan by Wren for preserving the crazy fabric by still further innovations being under discussion,—in 1666, the memorable fire of London cut short these deliberations by placing the venerable pile evidently beyond repair. The self-taught architect of London, and greatest of architectural constructors, now began various designs for a "fabric of moderate bulk, but of good proportion; a convenient quire, with a vestibule and porticoes, and a dome conspicuous above the houses." It will be observed that here is no mention of nave or aisles. In fact, he was planning what, strange to say, the world has not yet seen—a solemn and *real* Protestant temple, not a *counterfeit* Roman Catholic one. He would have erected



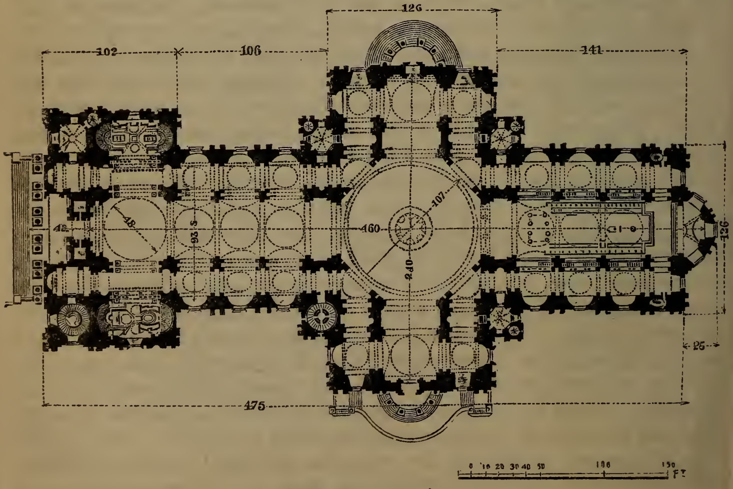
Sections through the transept and dome of St. Peters (1 1 1 1), *Florence Cathedral* (2 2), *London ditto* (3 3), *and St. Geneviève, Paris* (4 4), *showing their comparative widths and heights.*

an edifice on the principles and in the spirit of the mediæval church-builders, viz., an edifice whose form should be governed, as theirs were, by fitness to the service *for which it was built*, and by nothing else. This fitness would be promoted, as it was in the old churches, by the unstinted devotion of the best of everything, by every excellence, and every useful and splendid addition that ingenuity could devise, but not by superfluities. Wren's idea seem to have been that the Creator is not honoured by superfluities—by things of which His own works afford no example. That his temple for a reformed worship might *truly resemble* those once erected for the unreformed, it was not to be, like them, a church of altars and aisles, for masses and processions, but it was to consist chiefly of a clear space, large enough to contain the utmost number of persons that can hear one voice; lofty enough for majestic proportion, and ample store of air; approached by vestibules fit to intervene between the bustling world without and the solemn scene within; to guard one from the unseemly intrusion of the other by something more than a door; to afford the church at least the accessories, that a cottager's room claims—vestibules proportioned to itself—naves, if we like to call them so; but these were to be appendages to the prayer-house, not the prayer-house an appendage to them.

Such were the leading ideas of the many designs Wren proposed for solving this new problem in building—still, alas, new and unsolved—a Protestant temple. He shrunk from the idea of mocking Heaven with a sham offering; of worshiping in the cast-off clothes of an obsolete system; or, rather, in a copy of them, made to save the trouble of cutting out new. But, though the king and the nation had abandoned the old system, there was a most important personage who retained it, and, of course, hoped to see its revival. The heir-apparent saw that, though the temples of his faith had, indeed, been made to serve for the new, they did so most imperfectly; and only by shifts and fictions, such as *his* co-religionists would be too earnest to tolerate for a moment; and he saw that an edifice built for the new form of worship would be even less available for the old, than its cathedrals were for the new, which does just contrive to screw itself into one corner of them. It was, therefore, an object of his solicitude to see that this costly structure should at least be of some use in the event of its expected change of destination, and in this he unfortunately succeeded most completely.

No perplexity that can assail an architect can well equal the difficulty of Wren's task, between a Protestant nation and a Catholic future monarch, to plan a temple that might upon occasion serve for either religion, and therefore for neither well. Even in his ingenious plans for this purpose, however, he was baffled, not so much by the influence of the future king and his creed, as by that quality of his countrymen which, under the name of Conservatism, may be sometimes a very useful one, but on this occasion became nothing less than an unreasoning animal obstinacy, whose rule was "what has been shall be, whether now fit or not." The clergy insisted that the new building should resemble a cathedral; by which term they could or would understand nothing but the peculiarities of an *English mediæval* cathedral, as patched up and made to serve its new destination; for many cathedrals, even St. Peter's itself, resemble Wren's earlier designs much more than they do the present edifice. Many a deep study had to be wasted, many a beautiful invention abandoned, before he could descend to a design sufficiently tame and common-place to meet their notions. It seems they would oppose, as "unlike a cathedral," every plan that was shorter than 500 feet, every one whose central avenue was wider than 40 feet, or which was without a complete circuit of aisles. Neither would they admit, in any member, a proportion for which there was not Gothic precedent; nor could any customary part of the old churches, even to the triforium, be allowed to pass unrepresented. We believe they would have stifled the only remaining loophole for Wren's genius, by insisting even on the four central piers at the crossing, had there not fortunately been a precedent, and that an English one, for their omission, in Ely Cathedral. However, out of this, the sole concession he could wrest from dogged routine, he managed to make his work a new and unique one; and, what is far more important, one that might, at some future period, be made to serve the purposes of the reformed worship; not indeed with the decorum he had contemplated in his favourite designs, but without any very flagrant absurdity. He foresaw that a time must arrive when the common sense of his countrymen (to say nothing of taste or right feeling) would revolt at the idle mockery of a temple large enough to hold 20,000 people, barely affording an oratory for 200 in one of its recesses, and these deafened with the tramp of gazers in other parts of the vast useless carcase. Though that time has not even yet arrived, he made provision for it, as far as they would let him. He provided a clear central space, loftier and far grander than the rest of the edifice; large enough to serve conveniently for about 4000 worshippers, all within sight and hearing distance of two or three points; large enough, or at least important enough to be the evident nucleus or main body to which the other parts of the building are appendages; and lastly, if fitted as an auditory, nearly free from extraneous noise, because *itself* occupying the place whence the echo and resonance of footsteps almost entirely originates. It must be allowed, indeed, that even with the auditory in this its obvious place, and enlarged to the utmost extent that the best voice can reach, the eastern and western arms of the building would still be preposterously lengthy, the one for a chancel, and the other for a vestibule or ante-church; but this, as we have seen, he could not help. Being rigorously required to fill out the complete cathedral length of 500 ft., and give something corresponding in place and dimensions to every part and member of the Gothic model,—in a word, to make a fabric perfectly adapted to *every* requirement of the old worship,—he could not, at the same time, make it also perfectly and decorously available for the new. That he did so to such an extent as he has done, will be matter of no small admiration, whenever the building shall be adapted to this purpose; which it would be an insult to our readers to pretend that it now is.

A model of one of Wren's earlier designs (we may with some reason suppose it his favourite) is extant, in a very mutilated state, in a loft over the north-west chapel of the nave, and is equally worthy of notice with the existing building itself, if not more so, as showing the great master's ingenuity in the higher branches of his art, which the executed fabric cannot be said to do, the general form and proportions being none of his, but settled, as we have seen, partly by Romish views, more by stubborn routine, and merely given him to construct and decorate as he best could. Against the fancied conservatism, but really unprecedented innovation, that required a building planned not for its own purpose, but to imitate those planned for a different purpose; against the spirit of plodding dulness that would have nothing but a copy of the average Gothic skeleton, stripped of all individualities, and dressed in a different style,—he fought hard and long, and yielded only inch by inch. He was hedged in by barriers of fancied rules, unknown to the mediæval designers from whom they were professedly drawn, and having no parallel but in the art-banishing dogmas of nineteenth-century ecclesiologists. Yet all this, though it sadly curbed, did not paralyse the genius of Wren, which yet struggles forth at every possible opening, and might meet most of the



PLAN OF ST. PAUL'S.

criticism of his nation with the retort of the ancient artist, "What you admire is mine, what you condemn is your own."

This vast work is the only one of its class begun and finished in one age; and, what is still more remarkable, under one bishop by one master-mason, and (except a few contemptible super-additions) by one architect. It was commenced in 1675, nine years after the fire, and finished in 1711. The plan annexed will show that it resembles an Anglo-Gothic church of the largest class, except only in the breadth and fewness of the severies or compartments. The usual four piers at the crossing are omitted, so as to throw the weight of the dome on eight surrounding piers (as at Ely Cathedral), and the re-entering angles are strengthened by four massive towers, three containing vestries, and one a staircase, all continued to the height of the clere-story walls, or about 100 ft. from the ground. To the west front, which was intended for the principal entrance, are added laterally, beyond the breadth of the building (as at Wells and Rouen), two bell-towers which rise with pyramidal summits, to *double* the height of the roofs; and behind or east of them, are two oblong chapels rising no higher than the aisles, but having rooms over them, corresponding to the clere-story. On the eight central arches are built two concentric circular walls, the outer supporting a complete colonnade, 140 ft. in diameter, admirably contrived to abut the inner, which carries the domes. These with their lantern, crowned by a gilt copper ball and cross, rise altogether to *thrice* the height of the roofs, or 365 ft. from the ground, 356 from the floor of the church, and 375 from that of the crypts*.

Simple ratios prevail between all the leading dimensions, and especially the ratio of 1 to 2 between the breadth and height of openings, avenues, and spaces. Thus the windows are chiefly 12 ft. wide by 24 high; the aisles 19 ft. in clear width by 38 in clear height; the central avenues 41 by 84† (a deficiency of only one foot in breadth); the beautiful domed vestibule at the west end, 47 square by 94 high; and lastly, the central space, 108 in clear width, by 216 high. In clear diameter, this space is exceeded by that between the four piers of St. Sophia, 162 ft.; between those of St. Peter's, 157; the circular inclosure of the Pantheon, 144; the octagon (with four sides open) of Florence Cathedral, 138; and the crossing (with all sides open) of the mosque of Achmet, 130 ft.‡

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* We cannot guess the origin of the 404 ft. copied into most accounts, unless it be taken from the bottom of the foundations, or the level of the Thames. The *built* structures (omitting *framed* ones) which exceed this in extreme height, are those at Strasburg, Rome, Landshut, Vienna, Salisbury, Chartres, Cremona, Freyburg, Antwerp, and Brussels. But all these, except St. Peter's and Salisbury, are built from the *ground*, not suspended on arches. The only central or lantern erections exceeding St. Paul's are these two, and perhaps Florence or Milan, between which two last and our dome there seems an intended equality.

† These avenues are (within a foot or two) half the width of those of St. Peter's, the widest, and half the height of those of Beauvais, the highest.

‡ The common mode of comparison, by the diameters of the domes themselves, is

In height, however, it stands third, exceeding the Pantheon by 70 ft.; about equalling St. Sophia, but falling short of the Florence cupola by 50 ft., and of St. Peter's by 150. To show what various proportions have been admired:—at the Pantheon, the clear height is *equal* to the breadth, and at Achmet's dome about the same; at St. Sophia, *one-third* greater; at Florence and St. Paul's, *twice*; and at St. Peter's two and a half times the breadth. (See comparative section, page 181.)

Our view, projected from a point in the steeple of St. Martin's, Ludgate, with the houses omitted, will show the external form and decorations of the dome, incomparably the finest part; and the west front, which is next in merit. With regard to the rest of the exterior, it is to be observed that the aisles are included entirely in the height of the lower order of pilasters; and that the upper, which has empty niches instead of windows, is merely a wall or screen, erected, as some say, to hide the unclassical forms of flying buttresses, but we cannot attribute to Wren so very clumsy and disproportioned an expedient. He certainly had invention enough to have given those features a form harmonising with the style of the rest; and if not, no necessary features would be considered, except perhaps in the nineteenth century, to justify so gross an extravagance. Besides, the massiveness of this wall, about 9 ft. thick, precludes the idea of a mere screen, and seems to suggest that its chief motive may be to furnish a load like that of the Gothic pinnacles, but much heavier, to steady the piers below it against the thrust of the vaultings, without requiring very prominent buttresses.

This mock story, which is the most objectionable thing in the fabric, swells out its exterior, and gives it a false magnitude, but at the same time a flatness and sameness very opposite to the play and variety that would have arisen from the view of the upper story receding behind the lower, as in Gothic buildings, and only coinciding with it at the sheer precipices of the end façades, which owe half their grandeur to the contrast with this broken precipice elsewhere. The same falsehood too (of raising the outer wall everywhere to the full height of the building), has induced the shallow criticism in every mouth, that there should have been but a single order 90 feet high, instead of two of 50 and 40 feet. Now this would, in the first place, have been a further deception, for the building is not, as Wren's own designs were, of one story, but of *three*, answering in every way to the Gothic aisles, triforium, and clere-story. Next, an order 90 feet high could not be, with any materials this country affords (and indeed never has been in any country), so erected as to be really what it affects to be. The present orders are *real*, like those of the ancient

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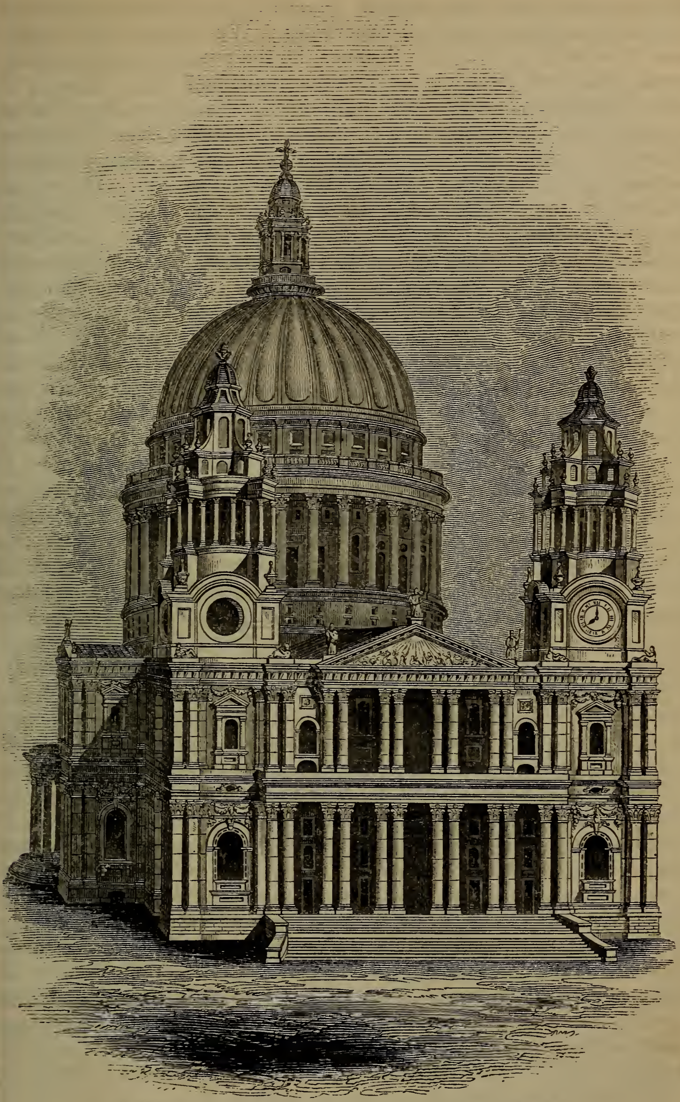
unfair, and places them in a very different order, thus: the Pantheon, 144 ft.; Florence, 142; St. Peter's, 139; St. Sophia, 115; St. Paul's, 100; Achmet's mosque, 92. But the real boldness and amount of available space is in the order given above. The palm still rests with St. Sophia, the work of the barbarous sixth century.



WESTERN VIEW OF ST. PAUL'S, FROM LUDGATE STEEPLE.

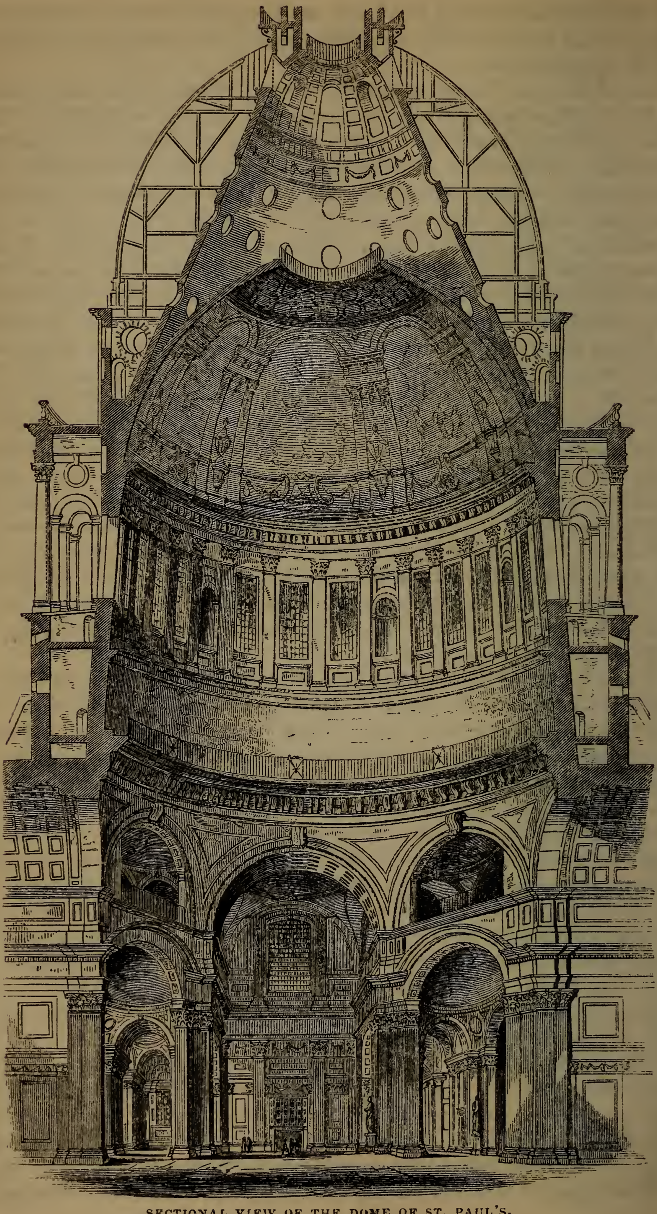
temples; the 90 ft. order would have been a *sham*, for it would be impossible to make a real one on that scale. Lastly, to fancy the building would have been grander, dressed in this colossal counterfeit, is utterly at variance with all experience. We estimate the magnitude of a building, first, at a distance, by the number of parts; afterwards, when we come nearer, by their individual size. Now, it is more important to make a good impression at last than at first—better that the work should improve on nearer inspection, than disappoint. Therefore, number of parts is to be sacrificed to size when we cannot have both, but the case is widely different when we *can*. It is essential, indeed, to grandeur, that those features which the grand building has in common with others, should all be larger than in ordinary buildings; but, provided they be decidedly larger, this is enough—any further enlargement of scale is mere waste, producing no commensurate effect, as all our examples of orders on a very exaggerated scale testify, for no one gives them credit for their real dimensions. Now the lower Corinthian order of St. Paul's is decidedly the largest likely to be erected, in its neighbourhood; and one of 90 ft. would, in a near view, have appeared very little larger, and therefore have made the building appear very much smaller; while the fewness of parts would have precluded all originality of arrangement, and all that variety of combination in which Wren excelled, and without which a building (unless it have all the sculpture of a Doric or the minute ornament of a Corinthian temple) cannot amuse or occupy the mind two moments. This front is called by Mitford "the finest piece of [complex] external architecture in the world;" the only one that caused him any hesitation in saying so being Perrault's front of the Louvre. More distance between the three chief planes, those of the portico front, the faces of the towers, and the small curtains connecting them, would have made it more striking; but the vulgar demand for a prominent portico, like that for a colossal order, forgets to ask how it could be executed in the genuine, sterling, and imperishable manner that characterises the whole of this noble work, no part of which depends for support or covering on either wood or iron. Its porticoes may be the least striking, but they are the only ones in England built, like those of antiquity, for all time. The chief real defect of this front is the coupling of the columns, for which there is literally no excuse. It is otherwise with the pilasters throughout the building, which, being in fact buttresses, required to be in pairs to give sufficient mass to each buttress, and also to avoid the solecism of the entablature making two external angles over the same capital, which gives whatever is below the appearance of total inutility, and, though common enough in nearly all other Italian and Anglo-classic architecture, never once occurs throughout the whole exterior of this vast work. The coupled and even overlapping pilasters are not nearly such an abuse as this.

The porticoes of the transept fronts would be highly beautiful, if their columns were only equidistant, and the detail within them is the purest and most classic in the building. The upper parts of these fronts, however, are most corrupt; and the east end is the poorest part of the whole, singularly clumsy, and deformed by arches of double curvature.

There is much flutter, or want of repose, about all the lower parts of St. Paul's, especially when contrasted with the simplicity of the dome and its accessories. These may safely challenge comparison with any composition of the same kind. The improvement on St. Peter's is no less remarkable in external design than in construction, and renders the application of the epithet, a "copy," or an "imitation," simply ridiculous. It is such an imitation as Watt's steam-engine is of Newcomen's. The sectional view (see page 190) will enable the visitor to understand the form of this masterpiece of construction. Its great peculiarity is the invisible conical structure of brick, interposed between the inner and outer domes, resting on the lower circumference of the former, and serving to support the stone lantern, the size and weight of which air-suspended fabric may be conceived from the fact that, if placed on the floor of the church, it would not stand under the ceiling of the nave. The supporting cone is most ingeniously modified at its upper part, to leave eight windows, and support the concentrated weight of the eight masses of the lantern. Its remaining portions, though pierced with numerous apertures, form a mere shell, only two bricks or 18 inches thick, and its base is confined from spreading by a wrought-iron chain imbedded in melted lead. The surrounding butments, however, are so well placed and contrived, that this precaution is probably superfluous, as long as they stand complete.

Every part of this building has, like the Gothic ones, two independent coverings, the inner of vaulted masonry, and the outer of oak framing, covered with lead. The beautiful outer dome, therefore, cannot be called unreal; it corresponds in structure to the upper roofs of all the other parts, and is in the most economical (as well as beautiful) form for a timber roof to cover such a space. The waste of internal capacity, in the unseen spaces between the innermost and outermost dome, is not nearly so great as in the roofs of Gothic buildings; and no part of this structure can be said to be (like a Gothic high roof or spire) erected for external effect alone, except the lantern. This, indeed, is so, for the highest windows visible from within, and which appear to form a lantern, are really situated below its base, in the upper part of the brick cone, and are ingeniously lighted from sunk areas, invisible from without, in the summit of the timber dome.

The interior of St. Paul's is very disappointing to those who, from the universal practice in the mediæval and foreign churches, expect to find such an edifice adorned with the artistic contributions of every age since its erection. The want of ornament, however (which instead of exceeding, as it should do, falls short of the quantity lavished on the exterior), is a minor fault compared



SECTIONAL VIEW OF THE DOME OF ST. PAUL'S.

Catholic routine of nave and aisles, and in these, of course, he could do little. The more licence he could obtain to deviate from this everlasting mimic basilica, the better he succeeded; and to say that this is the building in which the greatest deviation therefrom was allowed, is tantamount to pronouncing it his masterpiece. Though the exterior and belfry of this church have uncommon grace and decorum for that age, it is the interior that constitutes its fame. Though a simple cell enclosed by four walls, the tameness of that form wholly disappears behind the unique and varied arrangement of its sixteen columns. They reproduce and unite almost every beauty of plan to be found in all the cathedrals of Europe. Now they form the Latin cross, with its nave, transept, and chancel; anon they divide the whole space into five aisles, regularly diminishing from the centre to the sides; again we perceive, in the midst, a square apartment with recesses on all its sides—a square, nay, an octagon—no, a circle. It changes at every glance, as we view the entablature, or the arches above it, or the all-uniting dome. With the same harmonious variety, we have every form of ceiling brought together at once—flat, camerated, groined, pendentive, domical—yet no confusion. The fitness to its destination is perfect; every eye can see the minister, and every ear is within hearing distance of him, in every part of the service. It is the most beautiful of preaching-rooms; and though only a sketch, and executed only in counterfeit building, would, if carried out in Wren's spirit instead of his employers', form the most perfect of Protestant temples.

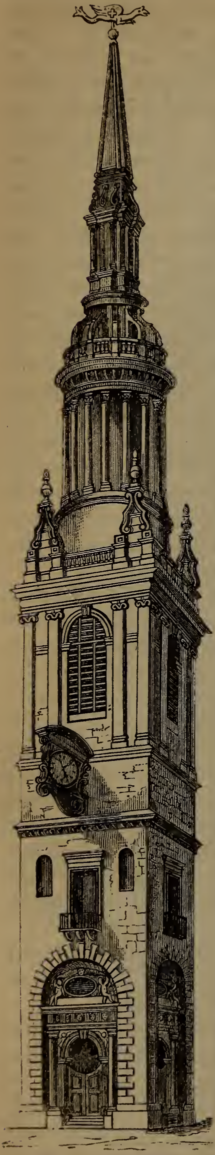
St. James's, *Piccadilly*, is about the largest of Wren's churches, but at the same time the most meanly built, everything about it indicating such extreme parsimony, that he seems to have given up the exterior in despair, bestowing on it only a few of his favourite cherubs' heads. It has lately been improved by the addition of a cornice, which it much wanted. But the fact is, that Wren, who had travelled no further than France, had, for want of seeing the Italian works, no idea of *astylar* architecture. He could do little without columns or pilasters. His taste was also thoroughly English in regard to projections and recessions, which are always petty and shallow. The interior of this church has an unique form of ceiling, contrived to mask an ingenious roof, which rests solely on the columns (independently of the walls), and has served as a model for that of some modern ship-building sheds.

Christ Church, Newgate Street (see p. 195), is very similar to the last, but with an elliptic central ceiling, and is one of the best-proportioned churches on the basilican plan, with galleries.

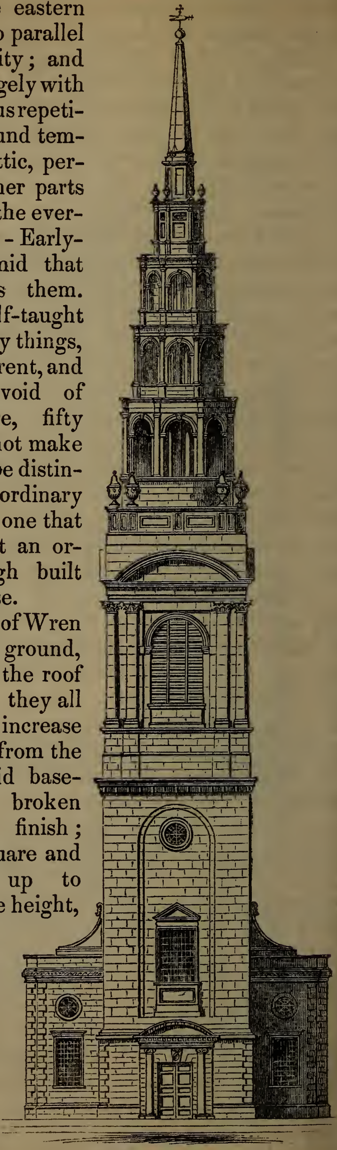
St. Anne and Agnes, north of the Post Office; *St. Martin's*, Ludgate; *St. Antholin's*, Budge Row; and *St. Swithin's*, Cannon Street, are among those which display the greatest originality of plan.

In nothing was the fertility of Wren's invention so strikingly displayed as in the *belfries* of his churches, which, being frequently the only parts visible at all from a right distance, received much attention; and their extraordinary diversity of forms (as seen from either of the eastern bridges) has no parallel in any other city; and contrasts strangely with the monotonous repetition of two round temples and an attic, pervading the other parts of London, or the everlasting mock-Early-English pyramid that now succeeds them. Here, one self-taught man builds fifty things, strikingly different, and not one devoid of beauty; there, fifty architects cannot make two that may be distinguished by ordinary observers, nor one that is ever thought an ornament, though built for nothing else.

The steeples of Wren all rise from the ground, and not from the roof of a building; they all have a regular increase of decoration, from the plain and solid basement to the broken and fanciful finish; they are all square and undiminished up to half their entire height, often more, but perhaps always to the middle of that portion expected to be generally visible above the houses; and in all, except

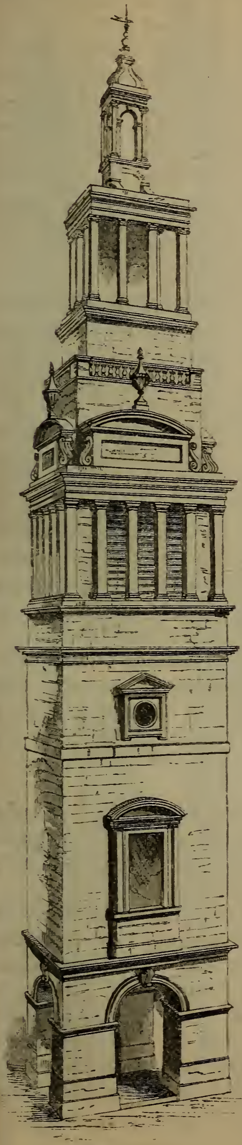


ST. MARY-LE-BOW.

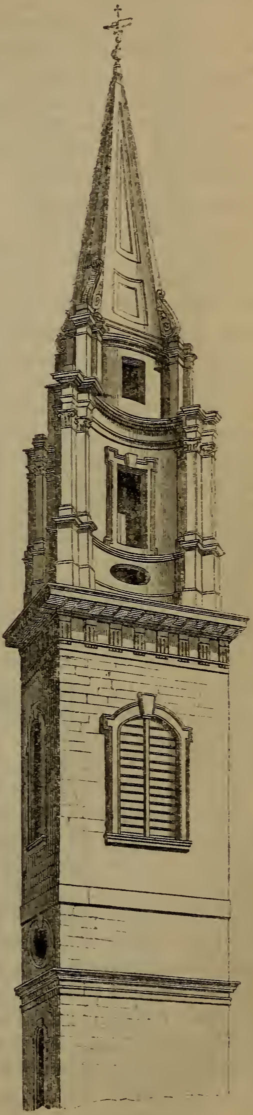


ST. BRIDE'S.

those of St. Paul's, the upper or pyramidal portion is so arranged that in almost every view its outlines may touch (and be confined by) two straight lines meeting at the summit. In later times all these rules have generally been reversed, especially the last, our modern steeples affecting a convexity of outline, whose prominent points are limited by the form of a pointed arch instead of a triangle. Wren employed this convex outline in the belfries of St. Paul's alone, plainly showing his sense of its fitness to a situation requiring more breadth and majesty; in fact, a character altogether distinct from that of parochial steeples, where he has given a lighter and more feminine expression by the triangular outline. The proportions of his triangle vary from an equilateral to one whose height is six times its base.

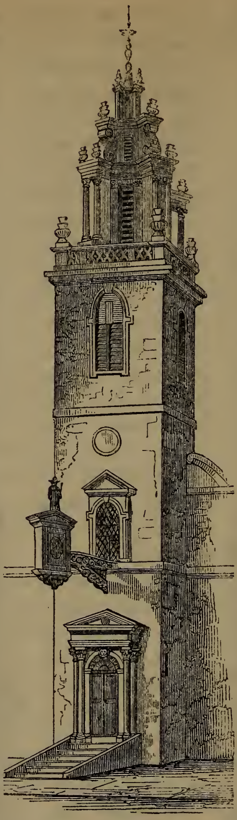


CHRIST CHURCH.



ST. VEDAST'S.

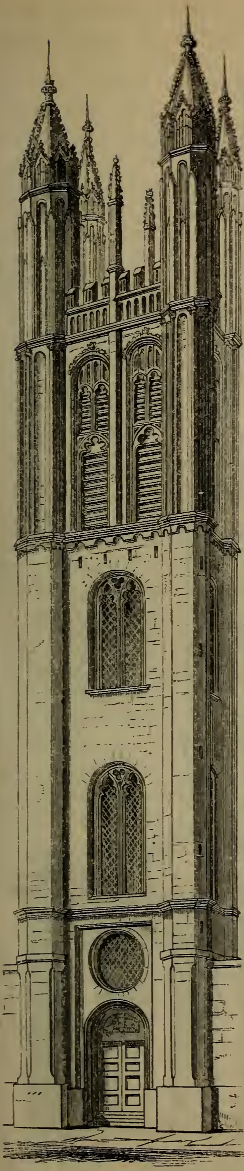
St. Mary-le-Bow, commonly called Bow Church, Cheapside (p. 194); *St. Bride's*, Fleet Street (p. 194); *Christ Church*, Newgate Str^{t}., and *St. Vedast's*, Foster Lane (p. 195), have the steeples of the tallest proportion; and the two former are the tallest in London, having been apparently intended to equal exactly those of St. Paul's, or about 235 feet, but St. Bride's, which has suffered much from lightning, has, in its repairs, been reduced a few feet. The diversity of these four steeples is admirable. Bow has been the general favourite, probably from the variety of plan in its different stories. In the other three, one plan, different in each, is preserved throughout the pyramid: in Christ Church, a square; in St. Bride's, an octagon; in St. Vedast's, a figure of four concave quadrants. The depth of hollowing in this last does not, in an English climate, form a sufficient substitute for thorough piercing or detached members, so that the whole is too solid and flat, but would answer well in Italian sunshine. ChristChurch has one great merit, that of more connection and mutual dependence between the stories than usual; but its outline has been destroyed by the removal of a few vases. St. Bride's is, considered by itself, far from the happiest of Wren's works, and, if it stood alone, would be justly called puerile, but it adds a pleasing variety to the general assemblage; and though *one* design on this principle is enough, that one required to be on a large scale to carry out the idea thoroughly.



ST. JAMES'S, GARLICK HILL.

St. James's, Garlick Hill; *St. Michael's*, College Hill; *St. Stephen's*, Walbrook; and *St. Bennet's*, Paul's Wharf, are some of the finest of his numerous steeples, whose upper part is limited by a pyramid of a lower proportion.

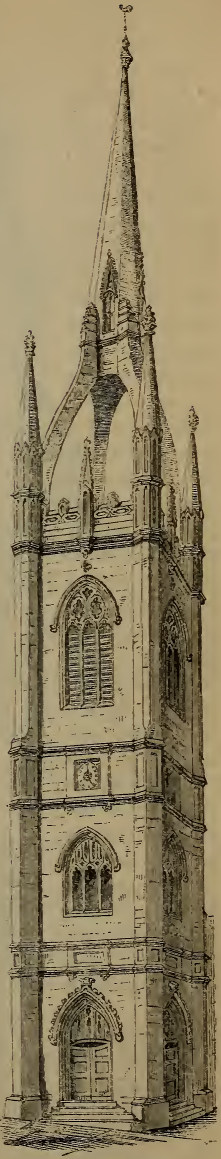
St. Michael's, Cornhill, and *St. Dunstan's*, near the Custom House (p. 197), present, in their belfries, Wren's nearest approaches to the old Gothic style; for his works present every shade of intermediate design between these and pure Italian. His faults, in the Gothic, are precisely the same as when following his usual style; but the flatness, shallowness, and littleness of mouldings, become here far more glaring, simply because his tendency this way is not restrained by rules and proportional measures, such as the Italian systematizers had laid down.



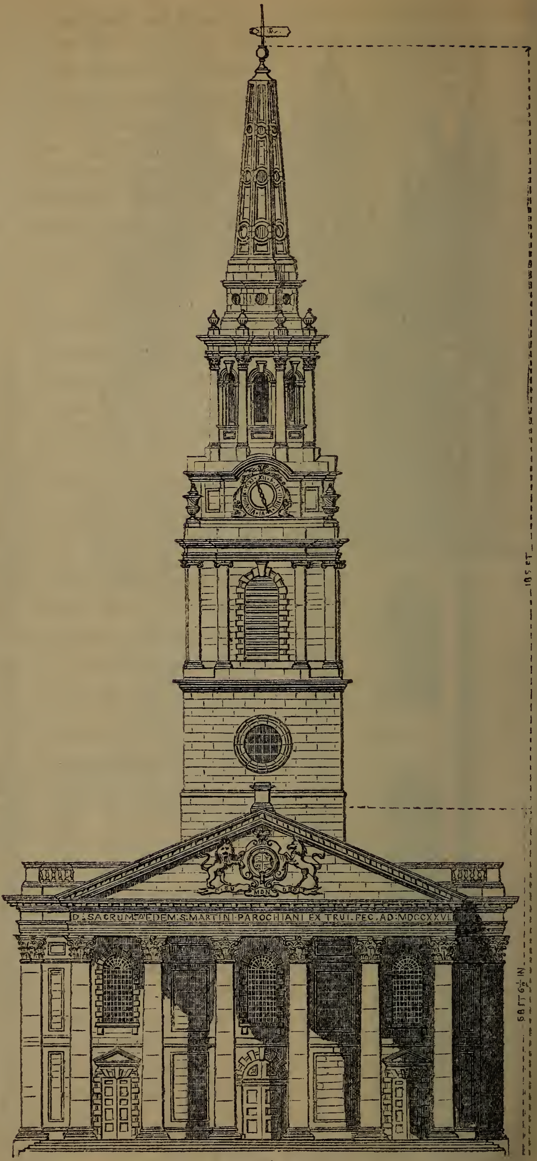
ST. MICHAEL'S, CORNHILL.

It will be observed, that though Wren's constant profession was to imitate the ancients, such an idea as that of the mere revival, or histrionic representation, of any ancient style, could never have been entertained by him; otherwise, his great admiration of Salisbury Cathedral and Westminster Abbey, and long employment on the repairs of both those matchless fabrics, could not but have led him to the production of some mock-Early-English, which, however, was reserved for this 19th century. His words, if taken in their modern sense, would strangely contradict his works, for his expressions of reverence for antiquity, and endeavour to follow its rules, could not have been more modest if St. Paul's had been only a sham temple, like the Madeleine or Walhalla.

The churches erected by Wren's successors, Hawkesmoor and Gibbs, were more liberally built and far more ornate than those of the great architect himself, especially their exteriors, which, however, were not, as in later times, enriched *at the expense of the interior.*



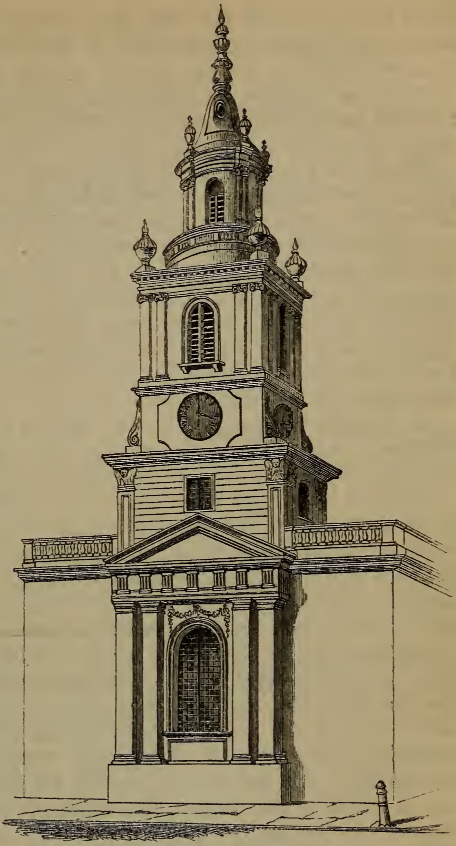
ST. DUNSTAN'S.


D·SACRUM·AEDEM·S·MARTINI·PAROCHIANI EX TRUI·FEC·AD·MDCCXXVI
DIEU MON DROIT
185 FT
58 FT 6½ IN.

ST. MARTIN'S CHURCH.

Five churches by these masters are worthy of notice:—

St. Mary's, Woolnoth, in Lombard St., is the masterpiece of Wren's pupil, Hawkesmoor, and by far the most original work erected since his time. The exterior seems to have been designed with a view towards the foreseen opening of a new street, which has since taken place; and both the north and west faces are well fitted, the former to its aspect, and the latter to its present situation. The interior is unique for a church, and apparently imitates Vitruvius' description of one sort of ancient atrium. Its great merit is, that the galleries, though very capacious, are not offensive. It seems incredible, did we not see proof of it on every side,



ST. BOTOLPH, BISHOPSGATE.

that a problem of daily requirement in modern times should, though solved more than once, be now given up in despair

St. George's, Bloomsbury, by the same architect, is remarkable for the picturesque grouping of its front, and majestic effect of its portico, which is on the principle of the ancient Roman ones, which style, indeed, this artist seems to have studied more than the modern Italian. The crowning of the tower, however, by a pyramid of steps, is a sad mistake. That form is (or represents) the most massive and solid in all architecture, therefore the most unfit form possible for a finish, and it should be replaced by some light open composition, inclosing and sheltering the statue, instead of hoisting it aloft to the storms.

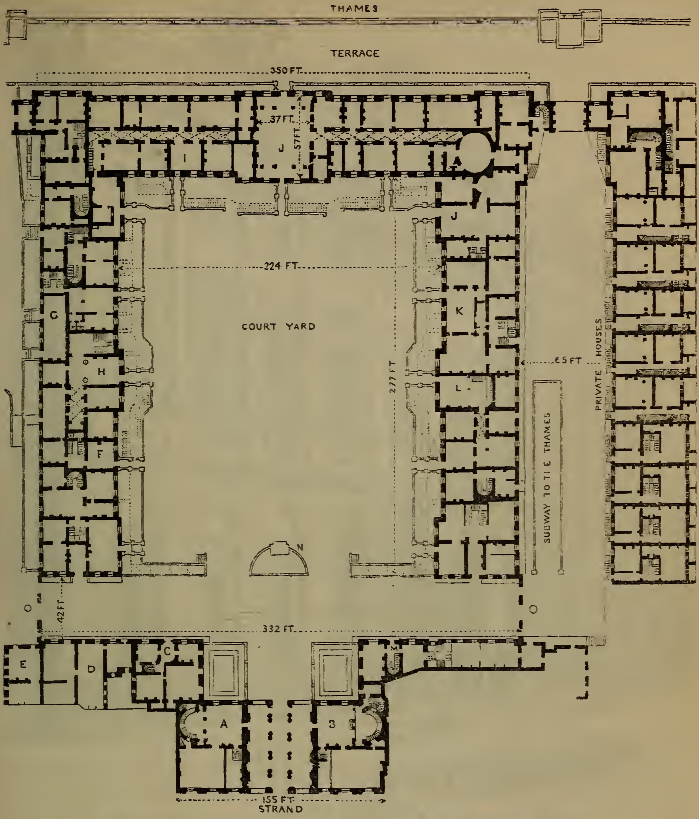
St. Mary-le-Strand, the first church erected by Gibbs, shows, altogether, a very tawdry taste, and is remarkable for the very singular conceit of making a single apartment appear externally of two stories. Even counterfeit littleness, however, is perhaps better than counterfeit greatness.

St. Geòrge's, Hanover Square, is the best, or rather the least faulty, of the works of James, who introduced the fashion of placing the belfry centrally behind a portico; which in this case was, perhaps, from the peculiar plan of the neighbourhood, its only good position, for it falls nearly in the axis of three streets, Grosvenor and Maddox Streets and Harewood Place, and seen from the latter, forms part of one of the very few groups in London that can be called picturesque. This belfry is also well fitted to its novel situation, and not too high for the portico below. The north side shows by its boldness, that *aspect* was still considered, and allowed to influence architectural composition, which, perhaps, it has never since done.

St. Martin's in the Fields (see p. 198), now in Trafalgar Square, and the most conspicuous church in London, is by Gibbs, and, though shining like a gem among more modern works, cannot be considered an improvement on anything preceding it. The steeple is here too much for the portico, and should have been placed elsewhere. The whole air is pompous and ostentatious, and the enrichment, which was now almost turned out from the interior to the exterior of churches, seems working itself to the surface, and introducing us to an age in which beauty should not even be skin-deep. The interior is in a style only fit for a theatre.

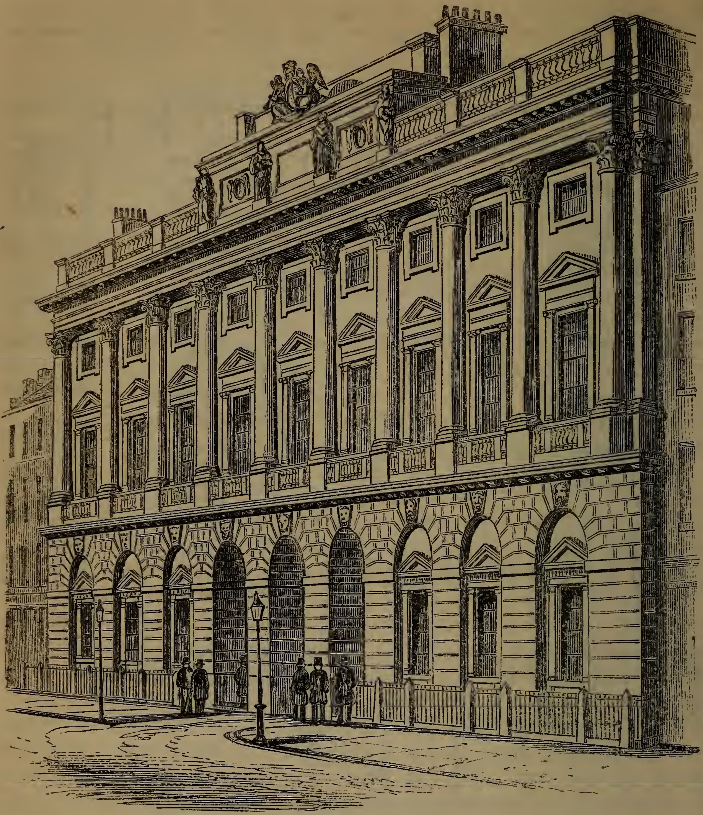
St. Botolph's, Bishopsgate (see p. 199), is a favourable specimen of the less pretending churches of the same age (that of George I.). It is the only known work of its architect, James Gold.

Somerset House, in the Strand, was commenced in 1776, by Sir William Chambers, the last adherent to the systematic and regulated architecture introduced from Italy by Jones, and it may therefore be regarded as terminating the third period, the brazen age, of English design. It consists almost entirely of small rooms, used as public offices, and, therefore, presents only external architecture; and this is confined to the clothing of the street front, 155 feet long, the river front about 600 feet, and the interior of the quadrangle, 319 feet by 224; the east and west sides of the exterior (though the latter is now the most exposed of all) being abandoned to the ineffable hideousness of the deceits required by bricklaying respectability. All above the cornice also has been left to grow into a forest of the elegant and varied inventions of the chimney-doctor; it having by this time become an admitted and established rule, that these, and many other parts of buildings (in fact, to define them in short, all necessary or useful parts), were excluded from the architect's province—not expected to appear in his drawings, and, in the actual execution, made allowance for, as necessary evils, invisible to the practised and tutored eye, which is expected to see the building not as it stands (and always will stand while in use), but as it *would* appear with the necessary blots, the objects of vulgar utility, abstracted. In fact, architecture had now become, to all intents, a "fine art;" one whose business was ornament; not to *make*, but to *apply* and combine ornament; and the ornaments given it as its materials were—the *useful* members of ancient building. Strange, that an art professing only to adorn, and ignoring vulgar use, can find nothing to take as ornaments except objects of use! We thus learn, then, that when these ornaments were


THAMES
TERRACE
350 FT.
37 FT.
57 FT.
J
I
224 FT.
COURT YARD
J
K
L
65 FT
PRIVATE HOUSES
SUBWAY TO THE THAMES
277 FT
G
H
F
N
O
42 FT.
332 FT.
O
E
D
C
M
A
B
155 FT
STRAND

PLAN OF THE CENTRE AND WEST WING OF SOMERSET HOUSE.

made, the practice must have been just the reverse of the present; their ornaments must have been their objects of use, and their objects of use their ornaments; as we have seen was the case in the *first* age of English art: whereas, now, the very term ornament implies something useless, so that all the members of a building are divisible into two classes,—objects of use, and ornaments; *i. e.*, *things without beauty*, and *things without use;* things which the eye abhors, but must suffer because they are necessary, and things which the purse grudges, but must pay for, because without them there would be no beauty. Out of these two opposite materials it is expected to make unity and harmony; harmony between utility and uselessness, and between beauty and ugliness. The task is utterly hopeless. Harmony in building is peculiar to the ages that employed neither of



SOMERSET HOUSE.

these things—to those in which architecture was not a fine art—in which there were no fine arts—no distinction between useful and fine—because the two qualities had not been abstracted—because no one had entertained the idea of making things either without use or without beauty.

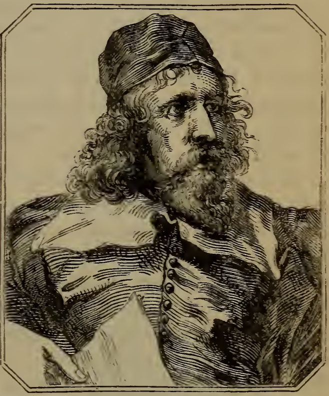
Abstracting, then, its objects of use, the work of Chambers has much merit, excelling most of Wren's in breadth and repose, and all of them in purity of detail, which he studied more than any other English architect, and in which he excelled even Jones. In all qualities related to grandeur, however, he falls far short of the latter; and in invention, whether constructive or decorative, cannot be named with the former.

The total divorce of use and beauty seems to characterize the end of the third period, that of rule, and to prepare or usher in the fourth, that of licence—that of many styles—that which can represent the works of every age but itself—and represent them not merely in details, but in whole things—the first age possessing only architecture,

> "Which, look'd on as it is, is *nought* but shadows
> Of what it is not."

For an account of the chief buildings erected in this age, the reader is referred to their several names or general designations, as "Churches," "Public Buildings," &c.

Architects.—In connection with the above, we here add a short memoir of the three men who have contributed most to the modern architecture of London, or that of the third period.



INIGO JONES.

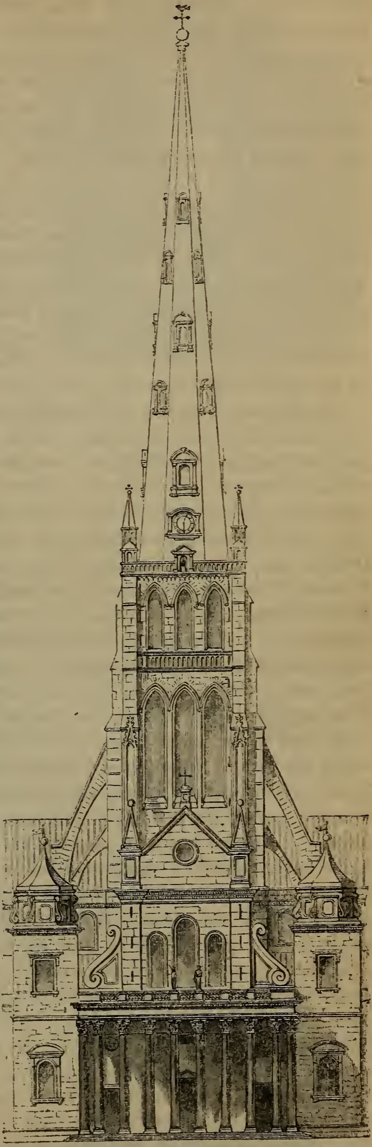
Inigo Jones, the father of modern English architecture, was born in 1572, under the shadow, some say, of St. Bartholomew's, Smithfield; others, of St. Paul's; the two noblest edifices of old London. His father, Ignatius, is regarded by some as a poor tailor, by others, with more probability, as an opulent clothier; who gave his son his own name, but in the Spanish form, in compliment to some merchant of that nation. The former apprentice Inigo to a joiner, chiefly on account of some vague hints in certain satires of his subsequent enemy Ben Jonson, which may more likely allude to his employment on the court masques, which the same poet elsewhere calls "mythology painted on slit deal." In fact nothing certain is known of the original rank, education, or early life of Jones, except that he gave some promise of talent for painting landscape, of which a specimen is said to exist in the Duke of Devonshire's villa at Chiswick. Some say that this drew the attention of one or both of two noblemen, by whom the expense of his first journey to and residence in Italy was defrayed; but his son-in-law mentions no such patronage, and he himself opens a work inscribed to the king (they being alive), with the words, "Being naturally inclined, in my younger years, to study the arts of design, I passed into foreign parts to converse with the great masters thereof, in Italy," &c. His family seem, therefore, to have afforded him this advantage.

During a residence of many years, chiefly in Venice, he is said to have become known for his architectural skill, throughout Europe (though the names of his foreign works are not known), so that before 1604 he was invited to Denmark, by King Christian IV., who made him his architect-general. As he executed no works in that country, his stay was probably not long; and, in 1605, we first hear of "Mr. Jones, a great traveller," preparing a masque to welcome King James on his visit to Oxford. Others say he came over in the suite of the king's bride, Anne, sister of Christian IV., though she did not arrive till 1606. He was now for many years chiefly occupied on the royal masques above named, of which Chapman, Devonport, Daniel, and Ben Jonson wrote the poetry. A quarrel with the latter began in 1614, and led him to satirize Jones unmercifully as long as he lived. Before his second residence in Italy, Jones seems not to have contemplated the wholesale importation of the style of that country (or rather of Venice), but only to engraft its details, as Holbein had done, on the Tudor littleness and baseness of general design. The chief permanent works in this, his first style, were—Sherbourne House, Gloucestershire; Heriot's Hospital, Edinburgh; and the inner court of St. John's College, Oxford, which have a piquancy and spirit vastly superior to the dull insipid uncouthness of the Elizabethan. Some ascribe to him partly the decoration of St. Catherine Cree, a much inferior work, but, like the others, displaying more search after mere novelty than anything else.

It is unknown in what year he again left for Italy, from whence he was after some years recalled, as the King had already made him his "surveyor in reversion," and that office was now vacant. He then showed what Walpole calls a Roman disinterestedness. The office of works had, under his predecessor, contracted a debt, "amounting unto several thousands of pounds," and, being consulted "what course might be taken to ease his Majesty of it, the exchequer being empty and the workmen clamorous," he offered "not to receive one penny of his own entertainment, in what kind soever due, until the debt was fully discharged;" and not only performed this himself, but persuaded the comptroller and paymaster to do the same.

The King, who, if a Solomon in wisdom, was the very reverse in other respects, was yet not prevented from undertaking that magnificent work, with which the name of Jones is chiefly associated, and erecting that fragment which the richest of nations has never found means to carry further.—(See "Public Buildings," Whitehall.)—Among the many merits of this design, not the least was its capability of progressive erection, without impairing the unity and symmetry of the portion at any time left. Thus, the present fragment being (see plan, p. 177) the west side of one of the smallest quadrangles, the two adjoining sides of the same might proceed progressively from it towards the river, always preserving uniformity and completeness, whether the square were closed by its eastern side or not. Again, after this, the opposite corresponding square, on the site of the present Horse Guards, might have been erected; or, what is better, the south-east square, on the site of Richmond Terrace, and in either case two grand corresponding masses, as at Greenwich, would result. Supposing the north-east and south-east quadrangles thus erected, they might be joined by either or both of their connecting ranges, and in either case a complete palace would have been formed, somewhat exceeding the present Palace of Parliament in extent, (though not in amount of building,) and with two very different fronts, towards the street and towards the river, the latter affording no small instalment towards the lining of quays proposed from time to time, but never attempted, to assimilate London with other capitals. Even this realization of one *third* of King James's project sounds wild and chimerical, but we mention it to show a peculiar merit of Jones's great design, which no other perhaps ever possessed in such a degree.

In 1620 he was appointed to repair St. Paul's, to which he added the Corinthian portico, at which critics have been so aghast, though always forgetting to show what they would have done in its stead, to preserve greater unity in the patched and crazy fabric. This famous portico, the first in England, was not inferior in scale to the largest of antiquity, or the masque of the British Museum. It had twelve columns in front, and three on the flanks, with no pediment, but balustrades and a statue over each column. Jones, however, was not, as events proved, well chosen as a repairer, having, perhaps, of all great architects, the least skill in construction. To this we may partly refer the paucity of his works now extant, though he was much employed on mansions all over the country. The



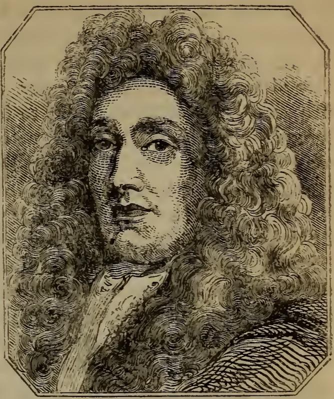
WEST FRONT OF OLD ST. PAUL'S.

chief remaining are, Wilton House, Wilts; the Grange, Hants; Cashiobury, Herts; and Gunnersbury, Middlesex. In London, besides what we have mentioned, and old Somerset House, destroyed, there remain, much altered, Lindsay House, Lincoln's Inn Fields, and Ashburnham House near Westminster Abbey. We have elsewhere mentioned the water-gate of York Stairs, the two northern portions of Greenwich Hospital, and the exteriors of Lincoln's Inn Chapel, Covent Garden Church, and the houses with arcades adjoining it.

Being both a royalist and a catholic, Jones felt heavily the troubles of Charles's reign and the Commonwealth. In 1640, under pretence of injury done to a little church abutting on the portico of St. Paul's, he was mulcted of £545; and, though never rich, he had recourse to burying money. He died in Somerset House, in 1652, his life shortened, it is said, by troubles, though it extended to eighty years. His tomb in the church of St. Bennet, Paul's Wharf, disappeared, like his portico, in the great fire fourteen years later.

De Quincy observes of his style, that it was almost entirely founded on that of Palladio, but that "imiter comme il a su le faire, c'est être toujours original." Neither were *his* works mimic Italian, nor those of his master mimic Roman. Yet they are *representative* to a degree exceeding all previous works, not indeed that the ornamental parts were more useless and foreign to the construction than in the later Gothic and Tudor, but that they were more cumbrous and costly. It would be hard if he could not make his works more effective than former ones, when incomparably more was *spent* on effect and mere superfluity. As a general rule, whatever renders them beautiful, is a sheer sacrifice of use to beauty; but this was the fault of the age, not the man; and it is unfair to charge it on him (as Walpole and Cunningham have done), for the art he practised did not profess to unite use with beauty, any more than our present architecture does, with its mimic buttresses, gargoyles, steep roofs, or sham belfries. But it *did* profess (which ours does not) to represent whatever it did represent, for the sake of beauty, not of mock antiquity; and to regard use and fitness in *general form* and arrangement, though not in details. Strip a modern Gothic church of its superfluous mock features, and where is its beauty? Strip the Whitehall design of the same, and there remain the beauties of fitness, grace, variety, and unity in the general form and disposition. These make the difference between the art of the brazen age and of the iron.

Christopher Wren, one of the brightest exemplars of combined greatness and goodness that this or any country has produced, was born in 1632, at Knoyle, a village of which his father was rector, in the vale of the Nadder, west of Salisbury. The family had for more than a century been singularly fertile in men of talent or learning, the most famous of whom was the architect's uncle, Dr. Wren, Bishop of Ely, almost a martyr to the royal cause, and



SIR CHRISTOPHER WREN.

imprisoned for twenty years for his fidelity thereto. His father, also, was Chaplain to Charles I., Dean of Windsor, and Registrar of the Order of the Garter. Christopher was his only son, and so weak and delicate in his youth, that he was reared with difficulty, and educated at home by a private tutor, except a short preparation under Dr. Busby, at Westminster, before his admission to the University of Oxford in his fourteenth year. Even before this, he had invented some curious astronomical and dialling instruments, a machine "that shall plant corn equally, without want, and without waste," a "pneumatic machine," &c., to which were soon added a "diplographic instrument for writing with two pens," and another for writing in the dark, a "weather-clock," a "treatise on spherical trigonometry, in a new method," a theory of the planet Saturn, and other contributions to the fresh dawn of physical science, too little remembered in her steady meridian blaze. He was the associate of Hooke in drawing his micrographia, (or, as one account says, the "*inventor* artis micrographiæ,") and made for Dr. Scarborough the first anatomical models, as he did also the first model of the moon's surface; and, in maturer years, the first model showing practically the optic action of the eye. He became known over Europe, both as a mathematician and experimentalist, even before the age of eighteen, at which he was made B.A. Three years later, he was unanimously elected a Fellow of All Souls' College, took the next degree, and was one of that small but choice band of philosophers who laid the humble foundation of the Royal Society. (See the Article "Learned Societies," and "Royal Society.") In 1654, Evelyn, no exaggerator, speaks of him as "that miracle of a youth," and afterwards, as "that rare and early prodigy of universal science;" and about this time he had a very great, if not the *principal*, share in the greatest discovery or invention of the time—that of atmospheric pressure and the barometer*.

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* Oldenburg, a Saxon then resident at Oxford, is known to have "betrayed the secrets" of this scientific club to his friends abroad, who have thus obtained the credit of many discoveries really belonging to this nation, and especially, it is said, those of the modest simple-minded Wren. The famous experiments of Otto Guericke are said to have emanated partly from this source; and in a register of the Royal Society in 1678, relating to some barometric experiments on heights, is this passage:—"Hereupon it was queried, how this experiment of the different pressure of the atmosphere came first to be thought of; and it was related that it was first propounded by Sir Christopher Wren, in order to examine Mons. Des Cartes' hypothesis whether the

In 1657 he succeeded Hooke in the chair of Astronomy in Gresham College, London; and in 1659 he was made Savilian Professor of Astronomy at Oxford. In 1660, when the little society above mentioned was consolidated under royal patronage, Wren, by desire of the rest, drew up the speech to be put into the mouth of the restored monarch, made ready their opening experiments on pendulums, and was desired to consider, with Dr. Petty, the philosophy of shipping, and report to them thereon. At this time we hear of fifty-three inventions, theories, or improvements by him, chiefly mechanical, but ranging through such a variety of subjects, that it would hardly be possible to parallel this curious list. There is an "hypothesis of the moon's libration," and a "way of embroidering beds, cheap and fair;" "divers new musical instruments," and "inventions for making and fortifying havens;" "easier ways of whale-fishing," and "the best ways for reckoning time, way, and longitude at sea." We believe a search among his forgotten studies would astonish by the number of famous inventions of later days that were present to his prophetic mind, but in vain, because the age was not ripe for them. It is singular that only two of this catalogue refer to the art that afterwards engrossed all his attention. We find among the crowd, "new designs tending to strength, convenience, and beauty in building," and "to build forts and moles in the sea." A year after this, however, he was made assistant to the office of royal surveyor, which, being held by Denham the poet, appears to have been merely nominal. In 1663 he was ordered to repair St. Paul's; and now appeared the most extraordinary proof of his aptitude to learn. Never was a subject learnt at once so late in life, so quickly and so well, as building in all its most technical and practical branches, by this wonderful man.

In endeavouring to repair Jones's unscientific patching, and the original defects of the crazy pile, he made a most masterly proposition, to remodel the centre on the plan of the octagon at Ely, and to replace the thin weak tower, by a majestic dome, which would probably have most resembled that at Florence. To fit himself, however, for his new office, he judged it necessary to glean instruction abroad, and therefore, in 1665, proceeded to France, but (to the great and irretrievable loss of our country) no further. What his geometric and constructive skill might have produced, if tempered with the pure taste to be drawn from the old Italian works, it is impossible to overrate—we should have had buildings eclipsing all others in the modern world. But his taste, instead of being refined

passing by of the body of the moon presses upon the air, and consequently also on the body of the water: and that the first trial thereof was made at Mr. Boyle's chamber in Oxford." Dr. Derham also says of the barometer, that, "to do every man justice, the real use of it, and the discovery that it was the gravitation of the atmosphere which kept up the quicksilver to such a height, which the learned abroad, particularly Torricelli, had only before suspected, was first proved by Boyle, at the suggestion of Wren."

by the air of Italy, was only corrupted (in matters of detail) by that of France, where design was then nearly at its lowest ebb. His industry in drawing and noting what he saw in Paris and its neighbourhood was such, to judge from his letters, that he talks of bringing home "all France upon paper." He frequented the works at the Louvre, where 1000 artisans were then employed, and would have "given his skin" for a longer view of Bernini's design for its completion, of which that mean artist, the moral opposite of Wren, would only allow him a five minutes' glimpse.

The next year saw that tremendous catastrophe which, sweeping off old London, its dark alleys, and overhanging plague-harbouring wooden dwellings, cleared the field on which all this lifetime of thought and observation was to be concentrated and thanklessly bestowed. There was no question about the architect of the new city. Fortunately for it, and for us, Wren was not the chief, but the *only* architect of his day. His design for rebuilding the 400 acres of wasted town was the most practical of the few ever made for such a purpose, and equally removed from the lower than animal instinct-work of American chequers, or the fairy dreams of Piranesi's Campus Martius. It was no "air-drawn Babylon," as one of his biographers calls it, though containing as much thought and contrivance as any. It is observable that there are no curved streets, for though Wren could not, even if the High Street at Oxford were the only example, be unaware of their beautiful effect, he thought it too dearly bought by irregularity in every room. His narrowest streets were to be 30 ft., and widest 90, for he knew that (as Portland Place shows) there is no advantage in roads wider than we can afford to keep clean and in repair. The design, however, though the most humble that the occasion would justify, was too great for those who dwelt in and could understand nothing but littleness added to littleness. The one golden opportunity was lost, and London rose again the most meanly planned and meanly built of cities. Private cupidity triumphed over convenience, health, and every other public good—not convenience over architectural display, as Ralph most strangely puts it. What convenience he could see in the narrow winding lanes, it is difficult to imagine.

Wren's first architectural works, or those first finished, are said to have been the old Custom House and Exchange (both burnt down), Temple Bar, and the Theatre at Oxford, remarkable for construction, but not for good taste. About the same time (1668) he visited his native valley to rescue from threatened ruin—which he did with perfect success, and without a touch of "*Restoration*"—that national Parthenon, that beauteous and unique monument of Young England's own unborrowed art, the Cathedral of Salisbury. Thus do we owe to the same hand the present existence of the two only great and uniform temples in Christendom; the only two, of the largest class, permitted, by a special favour to this nation, to resemble the Saviour's seamless robe*. The same genius preserved us one, and produced us the other.

In 1673, Sir Christopher, as he was now become, resigned his astronomical chair, and in 1675 laid the first stone of his great work, after nine years' war against prejudice and parsimony that, actually, for no less than two years after the fire, would hear of nothing but still patching up the tottering ruins. Most of the *fifty* churches to be rebuilt in the city occupied him about the same time, to which were added, in 1682, the Military Hospital at Chelsea, of which he was not merely the architect, but contriver of its laws, regulations, and whole internal economy, which to this day are esteemed a model for similar establishments. About the same time Charles II. had a fancy to erect a palace on the site of that of his remote Saxon ancestors, at Winchester, but it remains, of course, unfinished, and unsightly from the absence of the domes, and all other designed appendages. It occupies a space of about 300 feet square, and in style is very similar to Chelsea Hospital. Another abortive project of the same monarch, for which he made a gorgeous design, was a circular domed mausoleum to Charles I.† With such an unparalleled amount of work on his hands, we cannot wonder that, in 1684, Wren resigned the Presidency of the Royal Society, of which, from its infancy, he had been the chief, often the only, working member. Till then, the care of all the public buildings rising in the new city, and the greatest in the provinces, did not prevent his supplying that body with nearly all the matter they received in pure mathematics, astronomy, and the laws of motion—with nearly all that rose above mere curious trifling, and that paved the way or received the grateful acknowledgment of the coming Newton, a name greater than that of his precursor in one respect, but not greater in breadth of genius, activity, or moral excellence.

The disinterestedness of Wren was at least equal to that of Jones. His greatest failing was said to be his inability to enrich himself; and if success in an art is to be measured by the gain it brings the artist, he little deserved the place fame has assigned him, for never were the most paltry designer's labours sold so cheaply as his. His remuneration for the whole contrivance and superintendence of St. Paul's, in which he seems to have had only one assistant, was a salary of £200 per annum, one half reserved till the completion of the work, as an incentive to diligence. For all the other fifty churches he had £100 per annum. It must be remembered he was the only man in England capable of doing these things, and that the relative value of money and other commodities was nearly the same then as now.

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* This expression, used by Bartholomew with reference to St. Paul's alone, applies equally to the Early English cathedral. Its central feature is not so different in style from the rest, as the corresponding part of St. Paul's from its other parts; and has the advantage of differing in the right direction, the less simple style coming *above* the more simple, instead of the reverse. The only great foreign church comparable with these for unity, is probably the Cathedral of Pisa, far inferior to either as a work of art. The rarity of this excellence, even in churches of far smaller dimensions, is very remarkable.

† The abandonment of this design cannot be regretted, as it was to have occupied the site of a work of the silver age of art, late indeed, but singularly fine and pure for its age, the small chapel east of St. George's at Windsor, commonly called the Tomb-house.

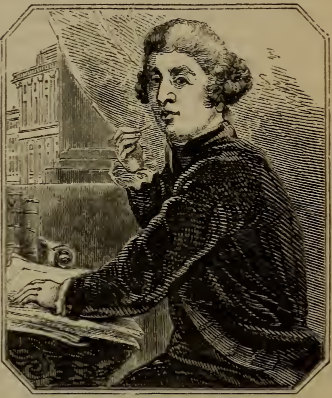
At the peaceful revolution in 1688 the fabric of St. Paul's seems to have reached the level of the aisle roofing, so that it was much too late to rectify any of the injurious modifications of plan required to suit the views of the deposed monarch. William and Mary employed Wren on the classical parts of Hampton Court, but their Dutch taste and crotchets so influenced this work that it is unfair to regard the design as his. For them he also commenced, in 1696, the southern portions of Greenwich, now first made a hospital, and to this, his second greatest work, that he might share in the charity, he gave all his services gratuitously.

About this time he ceased to be the *only* English architect, his pupil, Hawkesmoor, and Vanbrugh, Gibbs, Archer, and some others having arisen, to show in the fifty new churches ordered for the metropolis in Queen Anne's reign, the wonderfully rapid decline of taste in the nation at large, and of every kind of skill in the artists, among whose increasing numbers it seemed to be divided *ad infinitum*. In 1710, he laid the last stone of St. Paul's, at the age of seventy-eight; and, up to this time, seems never to have had an enemy. The anonymous pamplets that now appeared respecting his "frauds and abuses," he thought fit to answer, though to us at a distance they dwindle into their true insignificance, and contain their own refutation. The final shameful neglect of this great man, however, began with the accession of George I., soon after which he was actually degraded from the office he had filled for half a century as none else ever filled it, to make way for a glib pretender, whose utter incompetency required his almost immediate exchange for another of the same stamp. Classical antiquity, however, affords parallels to the treatment of this rare ornament and benefactor of his country, whose too long life, it has been well observed, enriched the reigns of many princes, and disgraced the last of them. From the age of thirteen to that of eighty-six, we search his memoirs in vain for any interval of time devoted to self, and even now, from his retirement at Hampton Court, the helpless old man was carried to see and superintend his last and only unsuccessful work, the west front of Westminster Abbey, of which it is too often forgotten that he did *not* live to direct the upper and more objectionable parts. At length, in 1723, he gently sunk and expired without illness or pain, and was buried under his own great work, where, with a justice most rare in such matters, his memory is celebrated by an epitaph, one of the truest and noblest ever graven, one in the very taste he would himself have admired, and of which the only fault is its not appealing to the eyes and arousing the emulation of *all* his countrymen by using a tongue common to them all.

BENEATH IS LAID
THIS CHURCH'S AND CITY'S BUILDER,
CHRISTOPHER WREN,
WHO LIVED ABOVE NINETY YEARS,
NOT FOR HIMSELF, BUT FOR THE PUBLIC GOOD.
READER, IF YOU SEEK HIS MONUMENT,
LOOK AROUND.

While the general character of this great but most modest man seems one of the most spotless brilliancy that history affords, his qualities as an artist were just those which his peculiar and imperfect culture for that vocation would lead us to expect; with one remarkable exception. It might be supposed that a self-taught and late-taught architect, and one of unequalled general learning and classic polish, would be deficient (as Jones undoubtedly was) in the practical constructive skill commonly supposed to be best learnt by early association with operatives. But this was the very point in which Wren especially excelled. He realized the demand of the obsolete writer quoted by Vitruvius, that an architect should understand the business of each artisan more deeply than the artisan understands it himself. He knew more of carpentry than any of his carpenters, and more of masonry than any of his masons. He triumphantly refuted the vulgar notions about "rising from the ranks," for, instead of rising, he descended from higher pursuits to that of building,—descended from theory to practice, and there incomparably excelled all our "practical men," with their own weapons on their own ground. There is no bench-sprung architect, who, in this practical branch of his art, has ever passed mediocrity; to let alone all comparison with this most theoretic, yet most practical of builders. He is the champion of science against "rule of thumb." The other excellence in which he has never been approached by any other modern, is just what his inventive turn and geometric culture might have led us to expect, variety and novelty of geometric combinations. In this he resembled the Arab architects, in constructive science the Gothic, in decorative style the Classic; thus uniting something of each of the three great schools of this art, but something excellent of the two former alone. Decoration was his great defect, his details being always in a faulty taste, his general decorative design mostly still worse. With one splendid exception, the dome of St. Paul's, it is nearly always frittered, crowded, or deficient in shadow; sometimes all three; and none ever pushed further the English false taste for shallowness of relief.

At a time, however, when there is much said about *progression* and *retrogression* in architecture, it is worth remarking that Wren was the most retrogressive artist we have ever had, at least since the Gothic times; for none ever struggled so hard as he did to stem the torrent of time, and move contrary to the universal tendency of modern art, by rendering his works *less* representative than previous ones, instead of *more* so. He so far succeeded that, in the absence of history, we should take his works to be older than those of Jones; because they are more real, have more union of utility with beauty, less pretence, less sham construction, and less expenditure wholly for effect. These changes we hold to be truly retrograde, and Wren our last truly retrograde architect.



SIR WILLIAM CHAMBERS.

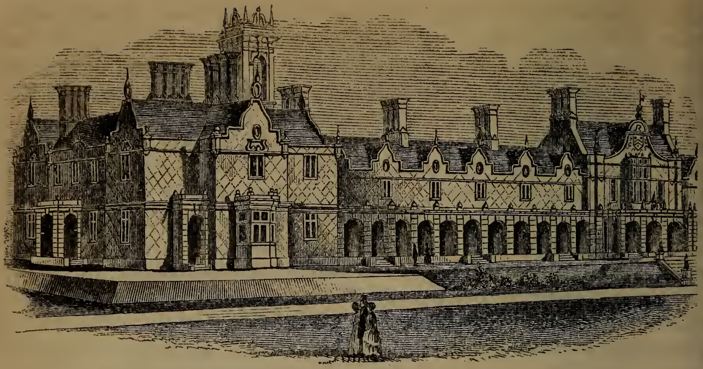
William Chambers, the last of the Anglo-Italian school of architects, and the English systematizer of this art, was the son of a Scotch merchant, and born at Stockholm in 1726. Two years afterwards his father returned to Britain, and settled at Ripon. The young architect's only education was at the school of that town, till, at the age of 16, he was sent as supercargo in a Swedish vessel proceeding to China. Having a talent for drawing, he brought home numerous sketches of the singular architecture and gardening of that country, which were engraved and published. It is doubtful whether he abandoned commerce for the study of architecture immediately on his return from this voyage, or went on a second. In either case, his skill in drawing seems to have been thought a sufficient reason for the new pursuit, and, about the age of 22, he proceeded to Italy to examine and imbibe the taste of the antique works and of the early revivers of classic art, as well as to measure and draw them, a step very necessary then in the absence of engraved collections (but not so necessary as the former). He is said to have combined the excellences of Michael Angelo, Sangallo, Vignola, Palladio, Scammozzi, and other Roman and Venetian masters of the fifteenth and sixteenth centuries; but we believe this really means nothing more than that he avoided the most glaring defects peculiar to each, especially in matters of detail, which were his forte; while, in general design, he cannot be placed beside any one of those masters. He also examined the best works of the French architects—to one of whom, Perrault, his own style bears considerable resemblance, probably from having been formed much in the same way—and he studied under Clerisseau at Paris. Poverty is said to have finally driven him home, but he then soon obtained, through a friend of the Earl of Bute, the situation of tutor in architecture to the Prince, afterwards George III., who, on his accession, made him royal architect.

His first and one of his best works was the villa of Roehampton, near Richmond. Others are scattered over the country, but the greatest, and that which fully exemplifies his general taste, is Somerset-house, London, begun in 1776. Early in his career, he had published two works singularly opposite in character and tendency. "Designs for Chinese Buildings," which were soon deservedly forgotten, and "A Treatise on the Decorative Part of Civil Architecture," which has ever since been a standard text-book to the architects of this country; being the only original one in our language on the plan of those of Vignola, Palladio, Perrault, &c. It seems hardly credible, that while laying down the law in such a purist and systematic manner, he should be actually engaged on the most anti-classic work of converting Kew Park into a Chinese garden, for the Princess of Wales, which he finished in 1765. In 1768, he was made Surveyor-General; and soon after helped to found the Royal Academy. In 1771 he was knighted by the King of Sweden; and, a little later, he published a "Dissertation on Oriental Gardening," remarkable for its pompous style; which called forth anonymously (it is said from Walpole), "An Heroic Epistle," and other satires, on the Knight of the Polar Star. These finally turned the tide of taste against the Celestial Empire; but could not stop the headlong plunge of building art into its ultimate phase of supposed liberty and real slavery to fashion, novelty hunting, and the extreme of mere representation. Having lived to see the commencement of this new era; and to see his own chief work the last of its class, and, with all its inferiority to those of his predecessors, unlikely to be rivalled by anything producible under the new system; this artist died of asthma in 1796, and has a memorial, in what may be called the artists' corner of Westminster Abbey.

ALMSHOUSES.

Almshouses, in which aged men and women are lodged and in most of them pensioned, are peculiar to England. They exist to a considerable extent in and about the metropolis. Their origin is of an early date, and a considerable accession of them for the retirement of decayed persons belonging to the principal London trades, have of late been endowed and located in the villages near London. The establishment and purpose of these benevolent institutions have emanated from the truly Christian spirit of pious persons. The stranger may be compensated by a walk from Whitechapel Church: in the Mile End Road, by proceeding eastward, he will first come upon almshouses, endowed 1698, by Mr. John Pemel, citizen and draper; a similar endowment, the gift of Mr. Lewis Newbury, citizen and skinner, 1690; almshouses wherein reside decayed masters and commanders of ships, or the widows of such, erected by the Corporation of the Trinity House, 1695. In this establishment of the Trinity House, there are thirty houses, most convenient and pleasant, with kitchen and outward entrances to the same; these quaint little houses are said to be from the designs of Sir Christopher Wren. There is a chapel at the extremity of the ground, and in the centre of the green is a statue to the memory of Captain Robert Sandes, who bequeathed a sum of money to this establishment. The Vintners' almshouses, founded and supported by the Vintners' Company, in the Ward of Vintry, 1357, erected and established here after the fire of London, 1676. Almshouses founded by Francis Bancroft, Esq. (grandson of Archbishop Bancroft), who bequeathed a sum of money, and died March 19, 1728; patrons and trustees the Drapers' Company, who, in 1729 built the chapel and school and twenty-four almshouses, and in 1803 built a dormitory for 100 boys, and again, in 1832, built four additional ones; these houses, with one story above the ground floor, are most convenient and neat, faced with red brick. The almshouses, the gift of Captain Cooke, 1733, for poor seamen and their wives; there are only four houses, apparently less exteriorly neat. Crossing the street approaching to Old Stratford Church, are almshouses for poor sailmakers; Mr. John Edmonson left an estate to the Drapers' Company, who built a chapel and sixteen almshouses, date 1706. In the same avenue are eight almshouses, four for each of the poor of Bow and Stratford. Still further east, on the same side, are almshouses bearing date 1744, endowed under the will of Mrs. Mary Bowry, for poor seamen and their widows, of Ratcliffe, Poplar, &c. Also, in the Whitechapel Road, the almshouses established in 1558, by William Megg, further endowed by Benjamin Goodwin, 1767. These nine separate endowments are all embraced within the mile, on a great public road on the Middlesex side, approaching the county of Essex, within two miles of Aldgate. Those of the Trinity Company, and Bancroft, are particularly interesting objects, and worthy of a visit. The almshouses of more recent erection are, for the most part, well and pleasantly placed, and extremely well designed, principally of the styles Early English and Gothic, giving them an indigenous, consistent, and picturesque representations suitable to English scenery and English habits. The following is a short account of them, as near as can with authenticity be collected:—

1. Alleyn's, Lamb's Alley, Bishopsgate Street, founded in 1614, by Edward Alleyn, for ten men and women, each to have 2*l.* per year.—2. Also, in Park Street, Borough Market, ten houses for the same number, each to have 6*d.* per week, and, every other year, a coat or gown.—3. Ayre's Almshouses, White's Alley, Coleman Street, founded, in 1617, by Christopher Ayre; in the gift of the Leathersellers' Company, for six poor men.—4. Susannah Amyas's Almshouses for eight poor persons, in George Yard, Old Street.—5. Armourers' and Braziers' Almshouses, for the poor of the company, in Britannia Place, Bishopsgate Without, founded 1554, by Lady Elizabeth Morrice.—6. Mrs. Allan Badger's Almshouses, Hoxton Old Town, founded in 1698, for six women, who are allowed 20*s.* per year.—7. Bancroft's, as before stated. —8. Rev. Mr. Basemere's Almshouses, Hoxton, founded 1701, for eight women.—9. Bethnal Green Almshouses, founded by Thomas Parmettier, in 1722, maintaining



BOOT-MAKERS ALMSHOUSES, MORTLAKE.

six men, provided with coals, and 5*l.* annually; fifty boys are educated also, and supplied with shoes, stockings, and books.—10. Charles Boone's Almshouses, founded in 1623, for six persons, a schoolmistress, and schoolhouse, at Lee, Blackheath; in the gift of the Merchant Tailors' Company.—11. Boot and Shoe Makers' Almshouses, erected recently by that society, at Mortlake, in Surrey, John Turner, architect, for the reception of twenty-five inmates. The centre part of the building has two towers; on the first floor is a committee room, with an open roof. It is a red brick and Bath stone building. The accommodation for the present is for fifteen persons (see view).—12. Bromley Almshouses, or Bromley College, at Bromley, in Kent, is for forty widows of clergymen, who receive each 38*l.* yearly, and other allowances. —13. Nicholas Butler's Almshouses, Little Chapel Street, Westminster, founded 1675, for two men and their wives.—14. Bakers' Company's Almshouses, at Hackney.—15. Brewers' Almshouses, Oxford Street, Whitechapel Road, for the poor of that company.—16. Mrs. Bowry's Almshouses, as before written.—17. Butchers' Almshouses, at Walham Green, Fulham.—18. Camden and Kentish Town Almshouses, Little Randolph Street, Camden Town, for twenty-four aged and deserving women.—19. L. Camp's Almshouses, 1612, for six persons of the parish of Allhallows, London Wall, and twelve persons in houses at Barnet.—20. Curon's Almshouses, Vauxhall, founded 1622, by Noel Baron of Curon, Dutch ambassador, for seven women of the parish of Lambeth, of 60 and above years of age.—21. Capt. Cooke's Almshouses, as before stated.—22. Coopers' Almshouses, Schoolhouse Lane, Ratcliff, founded in 1616, by Tobias Wood, for six persons.—23. Case's Almshouses, Park Street, Southwark, founded in 1584, for sixteen men and women, by Thomas Case.—24. Cutlers' Almshouses, Ball's Pond Road, Islington, twelve houses for twenty-four inmates for the poor of that company.—25. Mrs. Davis's Almshouses, Queen's-Head Lane, Islington, endowed 1793, for eight widows.—26. Drapers' Almshouses, or Queen Elizabeth's College, founded in 1576, at Lewisham Road, Greenwich, by William Lambarde, the antiquary of Kent. There are twenty dwellings, with gardens, and the inmates receive 15*l.* each yearly.—27. Dulwich Almshouses, Bath Street, St. Luke's, founded by Edward Alleyn, for ten women and men; the first brick was laid by the founder himself; each inmate is provided with 6*d.* per week, and, every other year, a coat or a gown.—28. Dutch Almshouses, Crown Street, Finsbury, endowed by wealthy Dutch merchants at different periods, a handsome and commodious building for twenty inmates of above 60 years of age; fourteen tenements are for the poor of the Dutch in Austin Friars; and each have a pension of 8*s.* weekly. This endowment is derived from property at Highgate, Hammersmith, &c.; one of the testators was Egbert Gent, of Overyssel, Holland, who died at Highgate, 1733.—29. Dyers' Almshouses, City Road, erected by the company, in 1755, for sixteen of their poor.—30.

The same company have Almshouses for ten inmates in St. John Street, Spitalfields.—31. East India Almshouses, Poplar, established at the granting of the first charter in the 17th century, for widows of mates and seamen dying in their service. The building consists of two quadrangles; residences for thirty-nine persons, receiving each from 9*l.* to 10*l.* per annum, with coals and meat in the winter. An upper square consists of eighteen houses, with gardens, for the widows of captains, receiving pensions varying from 30*l.* to 80*l.* yearly. Sir Charles Cotterell likewise bequeathed an endowment for six sailors' widows.—32. John Edmondson's Almshouses, as before stated.—33. Edward Edwards's Almshouses, in Church Street, Blackfriars, for decayed housekeepers or widows of that parish.—34. Emanuel Almshouses, in James Street, Westminster, founded by Lady Dacre, in 1594, for decayed persons of St. John's parish, Westminster. The estate, Brainbinton, in Yorkshire, yielding now 3000*l.*, is appropriated to this charity.—35. Fishmongers' Almshouses, or St. Peter's Hospital, were extensive buildings at Newington, for the poor of the company above 50 years of age, founded in the time of James I. These houses have been pulled down, and are reconstructed in the Tudor style, occupying three sides of a quadrangle, about 255 ft. by 235 ft., the fourth side opening towards the south, and upon the high road at Wandsworth, costing about 25,000*l.* Others are houses in distant parts.—36. Framework-knitters' Almshouses, Kingsland Road, for twelve poor freemen.—37. French Protestant Almshouses, founded in 1733, in Spitalfields, for supplying poor French Protestants with soup, meat, and bread.—38. Also in Black Eagle Street, giving residence and allowance to forty-five poor men and women.—39. Likewise for poor French Protestants and their descendants, in Bath Street, City Road, was founded in 1718. It is one of the relics of the great emigration after the revocation of the edict of Nantes; at one time no less than 230 refugees were sheltered in it, but the number of inmates is now 54.—40. Fuller's, Mile End Road, founded by Judge Fuller, 1502, for twelve ancient poor men of Stepney.—41. Also others in Old Gloucester Street, Hoxton, for twelve poor women.—42. Free Watermen and Lightermen's Almshouses, in Surrey, established in 1839, for sixty inmates.—43. Girdlers' Almshouses, Bath Street, Old Street Road, founded by George Palyn, in 1609, for six poor members of the company.—44. Goldsmiths' Almshouses, founded 1703, by R. Morell, for six aged liverymen, who receive 21*l.* annually, two chaldron of coals, and a new gown of the value of 2*l* 10*s.*—45. Also one at Woolwich, endowed by Sir Martin Bowes, 1565, for five poor widows, parishioners of Woolwich, who receive 25*l.* per annum, besides coals.—46. Almshouses at Acton, founded by John Perryn, rebuilt in 1812.—47. Graham's, founded in 1686, in Crown Street, Soho, for clergymen's widows or unmarried daughters.—48. Gresham's, City Green Yard, Whitecross Street, founded by Sir Thomas Gresham, in 1575, for eight poor persons.—49. Haberdashers' Almshouses, founded by Robert Aske, Esq., in 1692, Pitfield Street, Hoxton, by bequest of 31,905*l.*, for twenty poor men of the company, each to be allowed 30*l.* per annum; and for twenty boys, to be maintained, clothed, and educated, as much as would cost 20*l.* each.—50. Harmar's Almshouses, founded in 1713, by Mr. Samuel Harmar, for twelve single men and women.—51. Heath's Almshouses, Frog Lane, Tibberton Square, Islington, and at Monkwell Street, City, founded by John Heath, 1648, for ten freemen of the Clothworkers' Company.—52. Henry (King) the Seventh's Almshouses, Little Almonry, Westminster.—53. Hill's Almshouses, Old Rochester Row, Tothill Fields, founded in 1708, by Emery Hill, for six men and their wives, and six poor widows.—54. Also, he founded houses for three men and their wives, in Petty France, Westminster.—55. Rev. Rowland Hill's Almshouses, in Surrey.—56. Hinton's Almshouses, Plough Alley, Barbican, founded in 1732, by Mrs. Alice Hinton, for twelve widows of the parish of Cripplegate.—57. Holles's Almshouses, Curtain Road.—58. Holles's Almshouses, Great St. Helen's, founded in 1539, by Lady Holles and Mrs. Alice Smith, for six men and women.—59. Hopton's Almshouses, Green Walk, Christchurch, founded in 1730, for twenty-six poor men who have been housekeepers, with 10*l.* and a chaldron of coals annually to each.—60. Almshouses at Northfleet, just founded by Mr. Huggens, a merchant of large fortune, who has appropriated very handsome apartments for unfortunate gentlefolks, allowance 1*l.* per week.—61. Jeffery's Almshouses, Kingsland Road, founded 1703, by Sir Robert Jeffery; fourteen houses, with a chapel in the centre, for fifty-six persons of the Ironmongers' Company.—62. Judd's Almshouses, founded by Sir Andrew Judd, in 1551, for six men of the Skinners' Company.—63. Leathersellers' Almshouses, Clark's Place, Bishopsgate Street, founded by John Haslewood, in 1544, for four men and three women, decayed merchants of that company.—64. Also, by Christopher Lyre, in White's Alley, 1617, for six men and their wives.—65. And Robert Rogers, in Hart Street, Cripplegate, founded in 1612, for six men and their wives.—66. London Almshouses, Park Hill, Brixton, built in 1832, to commemorate the passing of the Reform Bill, for freemen electors of London and their wives.—67. Lumley's, City Road, founded by Lady Lumley, in 1672, for six persons.—78. Megg's, Whitechapel Road, founded in 1558, for the support of twelve widows, as before said.—69. Melbourne's, Crutched Friars, founded in 1535, by Sir John Melbourne, for thirteen women.—70. Mercers' Company are invested with several almshouses.—71. Merchant Taylors' Company are invested with almshouses in Princes Street, Rosemary Lane, for twenty-six widows.—72. On Tower Hill, founded by Richard Hills, for twenty-six widows; and since erected new almshouses at Lee, in Kent, at a cost of 9480*l.*, increasing the number to nearly forty.—73. Lady Muir's Almshouses, Stepney Church Yard, for twelve widows, each to receive 12*l.* per annum.—74. Morden College, Blackheath, founded by Sir John Morden, 1695, for decayed merchants. The founder demised, at the death of his lady, the whole of his estate to this institution. An allowance is made of 72*l.* a year, with coals, candles, washing, bath, medical and clerical attendance. The chapel has some wood carving by Grindlay Gibbons.—75. Monox's Almshouses, Walthamstow, founded 1686, by George Monox, Alderman, for eight men and five women, with a schoolhouse, and apartments for children.—76. Mr. Lewis Newbury's Almshouses, 1690, as before stated.—77. Norfolk Almshouses, or Trinity Hospital, near the Waterside, Greenwich, an old Elizabethan building, founded by Henry, Earl of Northampton, in 1613. The Mercers' Company are the trustees; the revenue of which is about 1200*l.* per annum.—78. Owen's Almshouses, Goswell Street Road, founded by Lady Owen, in 1609, for thirteen women.—79. Overman's Almshouses, Southwark, founded by Mrs. Alice Shaw Overman, of Newington, for eight single women, 1*l.* per month, and 10*s.* each on New-Year's-Day.—80. Packington's, Whitefriars, founded by Lady Ann Packington, 1560, for eight women.—81. Palmer's, Westminster, founded in 1654, by the Rev. James Palmer, for twelve persons, and a school for twenty boys.—82. Parish Clerks' Almshouses, at Camberwell.—83. Pemel's, founded 1698, as before stated.—84. Poulterers and Fishmongers' Almshouses, a very elegant structure in the Green Lanes, Southgate.—85. Rogers's Almshouses, Hart Street, Wood Street, founded, in 1612, by the will of Robert Rogers, pension 4*l.* per annum.—86. Printers' Almshouses, Wood Green, Tottenham, at a cost of 1750*l.*, a handsome building.—87. Rippon's Almshouses, New Park Street, Southwark.—88. Salters', Monkwell Street, founded in 1775, by Sir Ambrose Nicholas, for seven men and five widows.—89. St. Benet's Almshouses, Peter's Hill, Doctor's Commons. — 90. St. Clement Danes, Foregate Street, St. Clement's.—91. St. Giles and St. George's, Bloomsbury, Almshouses, Smart's Buildings, for twenty widows, with an allowance of 7*s.* a week, provided with coals, candles, and bread.—92. St. Leonard's Shoreditch, Hackney Road.—93. St. Martin's-in-the-Fields Almshouses, Bayham Street, Camden Town, consist of thirty houses for seventy almswomen on the parish foundation, and thirty-five out-door pensioners.—94. St. Peter's Almshouses, or Fishmongers' Almshouses, Newington Butts, founded 1618.—95. Sion College Almshouses, London Wall.—96. Stafford's Almshouses, Gray's Inn Road, founded in 1613.—97. Surrey Chapel Almshouses, Hill Street, Wellington Street, erected 1811, founded and principally endowed by the Rev. Rowland Hill, for twenty-three destitute females.—98. Smith's, founded in 1584, by D. Smith, St. Peter's Hill, Doctor's Commons, for six widows.—99. Smith's Almshouses, Hackney.—100. Tabernacle Almshouses, Tabernacle Row, City Road, consist of twelve houses.—101. Tailors' (Journeymen) Almshouses, at Haverstock Hill, for forty persons and their wives.—102. Trinity Almshouses, Mile End Road, as aforesaid.—103. Trinity Almshouses, founded in 1537, at St. Nicholas, Deptford; and another in Church Street, Deptford, founded by Sir Richard Browne and Captain William Maples, for decayed pilots and masters of ships or their widows.—104. Vintners', Mile End Road, as aforesaid.—105. Van Dun's Almshouses, York Street, Westminster, founded 1577, by Cornelius Van Dun, a native of Brabant, for twenty widows.—106. Weavers' Almshouses, Old Street Road, erected by Mr. Watson, for the widows of twelve weavers.—107. Also an endowment in Blossom Street, Norton Folgate, founded by Nicholas Garratt, 1725, for six decayed members of the Weavers' Company.—108. Westby's Almshouses, at Hoxton, founded in 1749, by Mary Westby, of Barking, Essex, for ten women.—109. Whittington's Almshouses, Highgate Archway, founded in 1421, by Sir R. Whittington, originally built on College Hill. The present structure is a very handsome one, in the old English style, erected at a cost of 20,000*l*. There is a resident clergyman, named the tutor; the inmates receiving 30*l*. yearly, besides other privileges.—110. Walter's Almshouses, founded by John Walter, in 1651, for sixteen men and women, in Cross Street, Islington. There are many others of recent erection.

For the information of our readers we will add the Rules and Regulations for the Government of the Inmates, as applied specially to the city of London's Almshouses.

1. The Inmates are expected to conduct themselves in a becoming manner; to appear clean in their persons, apparel, and apartments; and to attend a place of public worship at least once on the Sabbath Day.

2. The Inmates shall not be allowed to receive lodgers or have young children residing with them; nor be permitted to keep school, take in washing for hire, follow any trade, or engage in any occupation which may tend to interrupt the quietude, decency, and good order which at all times should be preserved.

3. No nails shall be driven into the walls; nor shelves, cupboards, locks, or bolts be fixed or removed; nor any alterations made in the rooms without the permission of the Committee.

4. No Inmate shall keep dogs, rabbits, poultry, pigeons, swine, or any other animal which may occasion a nuisance to others; no slops shall be thrown out, or accumulation of dirt or ashes be permitted, at or near the doors; but all sweepings or other refuse shall be removed at once to the appointed place.

5. The Inmates shall not be permitted to have any other residence than at the Almshouses, or to be absent from their apartments for more than a fortnight at one time without the special sanction of the Committee.

6. In the event of an Inmate marrying, he or she shall cease to derive any benefit from the charity; and the next Ward in rotation shall be called upon to nominate and elect for the vacancy thus created.

7. The Warden is required to lock the outer gates at 10 o'clock in the evening, and unlock them at 6 o'clock in the morning, from Lady-day to Michaelmas; and at 9 in the evening and 7 in the morning from Michaelmas to Lady-day.

8. The Warden shall keep a register of any deviation from these rules; and make a monthly report of the conduct of the Inmates to the Committee.

9. Every Inmate is expected to conform to these rules and regulations, for the better observance of which a printed copy shall be given at the time of admission.

ARTS, MANUFACTURES, AND TRADES.

In attempting to convey to the reader a general idea of the state of the useful Arts, Manufactures, and Trades of London, we are tempted not unnaturally, to cast a glance at England as a manufacturing nation, for it is a somewhat remarkable fact that the metropolis is by no means a fair exponent of the state of manufactures throughout the country. Our large manufacturing districts are, for obvious reasons, located in the vicinity of our coal-fields, and although large portions of the manufactured products find their way to, or are in some manner represented in London, yet very much larger portions obtain outlets, and are diffused over the country, and over the world, without any direct reference to the metropolis. London may be regarded as a vast trading and commercial, rather than a manufacturing town, and hence, from the great subdivision of employments, and the multiplicity of objects to be noticed, it is much more difficult to convey a general, and at the same time an accurate idea of the useful arts and trades carried on in this great city, than it would be to describe the industry of a town devoted to large and important manufactures.

As the eyes of the whole world are now being directed to London as the scene of the Exhibition of the *Industry of all Nations*, the inquiry becomes deeply interesting as to what position this country is likely to occupy in that momentous trial of skill. It is not difficult to foresee that the contributions of Great Britain to the *Palace of Glass*, itself a triumph of manufacturing and constructive skill, will be calculated to display our superiority in the production of *machinery* and of *machine-made goods*. As respects *taste in design*, and a *feeling for the beautiful* in the application of artistic skill to manufactures, she will probably have to yield the palm of superiority to some of her continental rivals.

But why, it may be asked, if England is inferior to some other countries in so important a matter as *taste*, is her power in the production of machinery sufficient to give her so much celebrity as a manufacturing nation? This question will find its solution in a brief consideration of the causes which have led to the superiority of this country in the production of machinery, and its results. These causes are, however, somewhat complex. But it may be stated as one of the chief advantages of England, that she possesses within herself abundance of raw material. She has vast subterranean stores of iron, copper, tin, lead, and other useful metals. The habits of the people lead to the production of much wool and leather. Flax is also grown in considerable quantities. If we had depended upon foreign nations for the supply of heavy and bulky articles, such as these, our advance must have been slow; but having these, we have the materials of machinery at hand, and can supply them in a thousand different ways which advancing science and improving experience from time to time suggest.

But the possession of those important raw materials would have been comparatively valueless, but for another bounteous gift of Providence, without which we must have been importers of iron and the other materials of machinery. We have an almost inexhaustible supply of coal. Had it not been for this, our steam-engines and spinning mules could not have had a profitable existence; but having the ores and the means of working them in greater abundance than any other people in the old world, if not in the new, our superiority in the production of machinery seems to be tolerably secure. The steam-engine is, as it were, the right hand of manufactures, and our coals are the muscles which set it in motion. Hence, our coals have been appropriately termed "vast magazines of *power*, warehoused and ready for use." Waterfalls have now lost much of their value, except under peculiar local circumstances; for steam may be supplied with greater regularity than water. It is under command at all seasons, while water is not. Any number of steam-engines may be erected in the immediate vicinity of each other, so that all the departments of manufacturing industry may be brought together in the same town, thereby producing a combination and adaptation of employments to each other, and a consequent saving of labour.

The value of steam-impelled labour may be illustrated by the following statement, which we borrow from Dr. Ure's "Philosophy of Manufactures." A manufacturer in Manchester works a 60-horse Boulton and Watt's steam-engine, at a power of 120 horses, during the day, and 60 horses during the night; thus extorting from it an impelling force three times greater than he contracted or paid for. One *steam* horse-power is equivalent to 33,000 pounds avoirdupois raised one foot high per minute; but an *animal* horse-power is equivalent to only 22,000 pounds, raised one foot high per minute, or, in other terms, to drag a canal-boat 220 ft. per minute with a force of 100 pounds, acting on a spring; therefore, a steam horse-power is equivalent in working efficiency to one living horse, and one-half the labour of another. But a horse can work at its full efficiency only 8 hours out of the 24, whereas a steam-engine needs no period of repose; and therefore to make the animal power equal to the physical power, a relay of 1½ fresh horses must be found three times in the 24 hours, which amounts to 4½ horses daily. Hence a common 60-horse steam-engine does the work of 4½ times 60 horses, or of 270 horses. But the above 60-horse steam-engine does one-half more work in 24 hours, or that of 405 living horses! The keep of a horse cannot be estimated at less than 1*s*. 2*d*. per day; and therefore, that of 405 horses would be about 24*l*. daily, or 7500*l*. sterling in a year of 313 days. As 80 lbs. of coals, or one bushel, will produce steam equivalent to the power of one horse in a steam-engine during 8 hours' work, 60 bushels worth about 30*s*. at Manchester, will maintain a 60-horse engine in fuel during 8 effective hours, and 200 bushels worth 100*s*., the above hard-worked engine during 24 hours. Hence the expense per annum is 1565*l*. sterling, being little more than one-fifth of that of living horses. As to prime cost and superintendence, the animal power would be greatly more expensive than the steam power. There are many engines made by Boulton and Watt 40 years ago, which have continued in constant work all that time, with very slight repairs. What a multitude of valuable horses would have been worn out in doing the service of these machines!

and what a vast quantity of grain would they have consumed! Had British industry not been aided by Watt's invention, it must have gone on with a retarding pace, in consequence of the increasing cost of motive power, and would, long ere now, have experienced in the price of horses, and scarcity of waterfalls, an insurmountable barrier to further advancement: could horses, even at the low prices to which their rival, steam, has kept them, be employed to drive a cotton-mill at the present day, they would devour all the profits of the manufacturer.

"Steam-engines furnish the means, not only of their support, but of their multiplication. They create a vast demand for fuel; and while they lend their powerful arms to drain the pits and to raise the coals, they call into employment multitudes of miners, engineers, ship-builders and sailors, and cause the construction of canals and railways; and while they enable these rich fields of industry to be cultivated to the utmost, they leave thousands of fine arable fields free for the production of food to man, which must have been otherwise allotted to the food of horses. Steam-engines, moreover, by the cheapness and steadiness of their action fabricate cheap goods, and procure in their exchange a liberal supply of the necessaries and comforts of life, produced in foreign lands."

The possession of raw materials, the abundance of coal, and the steam-engine, have been powerful auxiliaries in erecting this country into a great manufacturing emporium for the whole world; but these causes would probably not have been sufficient in themselves to produce so wonderful a result. We owe much to our insular position which enables us to maintain intercourse with all parts of the world, so that our manufacturers can obtain the raw materials and industrial products of other countries, and give in exchange for them the produce of our own manufactures. Surrounded as we are on all sides by the sea, the "great highway of nations," we can deal with the most distant as well as with the nearest people, by the cheapest method of transit. The soil and climate of this country are also highly favourable to industry. Although fertile, our soil produces few articles of value without the laborious exertions of man. Our climate is sufficiently severe to compel us to provide for wants which are less felt in more genial regions. Thus the difficulties of our situation call forth and stimulate our industry and develop qualities which produce a beneficial influence on the progress of society.

Nor is all this manufacturing and commercial industry checked and impeded by oppressive fiscal regulations. Ever since the accession of the House of Hanover, this country has enjoyed a free form of government, which has given a freedom to native industry, and at the same time has protected it by its strong arm. The manufacturer feels that the capital invested in his factory is as secure as if it had been laid out on an estate in one of the rural districts. If this were not the case, our mines of rich ore, our coal mines, the advantages of our insular situation, would all have been bestowed in vain; for the moment the idea came to be generally entertained that property was insecure, our career would be at an end. Ever since the celebrated Act of 1624, for the abolition of monopolies, industry, with some trifling exceptions, has been left quite free. It is true that we have not always been allowed to buy in the cheapest, nor to sell in the dearest market, but the most intense competition has always existed among producers at home. While France, Germany, Italy, Spain, and other countries, have had their industry clogged and their energies impeded by feudal and corporate privileges, every man in England is left to exert his own energies in his own way, to adopt every device by which he can best attain his object, and he is free to carry his labour and his produce to good markets.

The influence of taxation on manufactures is supposed by some to be beneficial rather than otherwise, exerting a healthy stimulus, and actuating the manufacturer by the fear of falling, while the desire of rising is natural to him; he is stimulated to increased exertions to meet the burden which taxation imposes, and in this way a much larger amount of wealth is produced than is abstracted by the tax. The most injurious influence of taxation arises not from its being oppressive in amount, but from the partial manner in which it is assessed; from its inequality, and its interference with the processes and details of industry. Much, however, has been done of late years to remove these injurious impediments, thus giving an assurance that those which still remain cannot long continue.

One of the most precious results of the free institutions of this country is religious toleration. Every man's conscience is left free, and he can adopt whatever form of worship accords with his notions of the revealed will. Hence the religion of this country being founded on Scripture, and not on dogmas or tradition, partakes of the practical character of the people. The precept which requires the individual to be "true and just in all his dealings," has been adopted by the nation, and hence we have *unbounded credit*, the consequence of a strict maintenance of public faith, and almost illimitable *wealth*, the effect of industrial and commercial enterprise. The progress of this country since the peace of 1815 has been perfectly marvellous. We have reformed our national system of representation—given freedom to municipalities—extended the limits of religious liberty—given freedom to the press—conferred political privileges on the great bulk of the population—and by an extensive system of cheap and healthy literature, enlarged their views and elevated their tastes. We have enlarged our commerce, expanded our powers of production in manufactures, and increased our agricultural wealth. The salutary consequence of all this has been, that the mind having been left free and independent, science has made gigantic strides, and enriched our useful arts and manufactures with most valuable discoveries. Our manufacturing towns have grown up into great cities—villages have expanded into towns—gigantic enterprises have been undertaken and completed with vigour, strength, and perfection—canals, docks, railroads, and other useful works, have been produced at an expense which must be estimated by hundreds of millions of pounds sterling. All these effects have naturally increased our power abroad, and our colonies have shared in the prosperity of the mother country.

One of the consequences of this freedom is displayed in the contest which has long been carried on, and now more fiercely than ever, between the rural districts and the great cities and towns—between land and trade—between the advocates of protection and the friends of commercial freedom—between the old and the new. The advocates of the old draw upon ancient associations for a standard by which to measure the imperfections of the present age. "The wide and pastoral valley, with all its flocks and spreading trees, sheltered and bounded by wooded hills, on the sides of which the hazel copse and wild hedge-rows are blended with the gorse, the bracken and heather; the white walls of the embowered cottage; the village-church; the gray ruins of the ancient abbey overhanging a bright and living stream—these remembrances of natural beauty, now in many instances defaced, make the contrast between the past and the present still more harsh. In the same valley the green turf may now be disfigured by banks of coal or black shale; the woodlands on the hilly slope may have given way to a succession of limeworks, with their trailing fires creeping along the surface of the earth, and effacing all trace of vegetable life. In the room of the picturesque and consecrated ruin, the ungraceful lines of a dark factory, with its gigantic chimneys alternately breathing flame and smoke; and, as if the pollution of all the elements was in a condition inseparable from this great revolution, the air is loaded with murky clouds, and the waters of the river, no longer transparent, are stained with the dye-stuffs and refuse of a hundred mills. The rural cottage, with its roses and woodbine, is replaced by a stiff and formal line of square brick houses, the foundations and walls of which have given way, and disclose in their rents and fractures the excavations of the land beneath. The change in the appearance of the inhabitants is equally great. The begrimed and sooty collier, the artizan, the colour of whose skin can scarcely be seen through stains of ochre or indigo, seem but sorry representatives of the shepherd or the ploughman. Peace, simplicity, virtue, order, stability, reverence for the laws of God, respect for the laws of man, are held up by the lovers of the poetic and romantic as the characteristics of the system which has passed, or which is passing away; whilst discontent, violence, love of change, an arrogant self-reliance, vicissitudes of pinching want, and vulgar indulgence, are, by the same class of reasoners, connected with our trading and manufacturing system."*

One of the witnesses examined some years ago before the Handloom Weavers' Committee, gives in a very few words a satisfactory answer to the arguments of the Protectionists:—"If I make a piece of cloth, and meet a Frenchman with a sack of corn on his back, I should be glad to exchange; but up steps a custom-house officer and won't let me, and I may eat my cloth if I can." Now, unless England can produce a sufficient supply of corn for the whole of her immense population, which she cannot do under the best system of agriculture, and at the lowest rents, or with land free from all rent, we must supersede this custom-house officer, and allow the foreigner to exchange his sack of corn for our piece of cloth.

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* "Edinburgh Review," No. CLV.

But the prosperity of our home manufactures not only affords direct subsistence to immense numbers of individuals, but acts powerfully on the agricultural and other classes, supplying them with an infinite variety of useful and necessary articles at low prices, and creating an almost boundless market for their own peculiar products. Some dairy farmers in Cheshire informed Dr. Taylor* that they had not discovered the inseparable connection between the two interests, until the closing of a mill in their neighbourood deprived them of all their best customers. In periods of manufacturing distress, the sale of agricultural produce, particularly milk, cheese, and butter, is greatly depressed. Nor is the influence confined within the limits of the manufacturing districts. It extends throughout the land. The herrings of Sunderland; the wools of Sussex, the butter of Cork, the malt of Hants and Essex, offer a standard by which to judge of the state of industry in Yorkshire and Lancashire.

There is no doubt that at the present time the low price of corn is operating disastrously on the corn-growers of this country. Every great change in our social relations calculated to benefit the great bulk of the population must prove injurious to a class. The few must suffer for the benefit of the many. The chief burdens of this country are borne by the manufacturing and operative population: it is by taxes collected from them that we keep faith with the public creditor, and support our army and navy. The burdens on land may, just now, be felt to be oppressive; rents imposed during the long period of protection, cannot now be paid; but, the time cannot be far distant when the farmer will find it to his interest to grow something more profitable to him than corn, and to throw into his proceedings a portion of that energy and scientific skill which has had such powerful influence in raising our manufactures to their present point of perfection.

The charge that has been brought against our manufacturing towns, that they are the seats of vice, turbulence, and infidelity, is not true. Large cities and small villages have their vices, for these belong to human nature. If the village is not disgraced by a gin-palace, it has its beer-shop. If the mill has not always been safe from the violence of refractory operatives, the rick-yard has not been secure from the midnight incendiary. In short, the vices of one system have their counterparts in those of the other. And may not their virtues be also similarly counterbalanced? There is no doubt that if large towns are bad, they would have been much worse but for factories. Factories have been the best academies for poor children, for they have thus been taken out of the streets, and brought up in habits of order, regularity, and industry: they have been regularly taught in the factory schools and in Sunday schools. Their health has been improved by working in spacious well-warmed and ventilated mills, and their earnings have enabled their parents to feed and clothe them comfortably and respectably.

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* "Tour through the Manufacturing Districts." 1842.

A thoughtful and suggestive writer remarks, "As men congregate in large numbers, it is inevitable that the strong should act as an impetus on the weak; in other respects also the presence of numbers is mainly on the side of intelligence. It is a mistake to suppose that minds of the same class possess no more power collectively than they do separately."* A practical illustration of this position is to be found in the fact, that publishers consider Lancashire as the most book-buying county in England, and the depression of manufactures is always found by its depressive effect on literature. The large number of writers engaged in popular literature look for readers more among tradesmen and artizans than among farmers and peasants; and, if it were necessary, numerous instances of this state of things might be quoted: one may suffice:—The Revising Barrister for Leicestershire stated a few years ago, that on the east or agricultural side of the county it was very common for overseers of parishes not to be able to write, and that generally when the population was exclusively agricultural, he found a degree of ignorance he was utterly unprepared for in a civilized country.

In coming now to notice the manufactures and trades of London, it will be found that the preceding details are by no means irrelevant. A very large proportion of the trade and commerce of the metropolis consists in receiving, appropriating, and distributing into innumerable channels the manufactured products of the provinces. There is scarcely a large factory in the kingdom that is not represented by some house in London, and many manufacturers have each their own special agent in London.

In order to convey an accurate idea of the trade of the metropolis, we have gone carefully through the *Trades' Directory* of that useful and laborious annual, the *London Post-Office Directory*.† We have summed up the numbers of houses or firms engaged in any one particular occupation, and have re-arranged the whole into eight distinct and tolerably well defined sections, namely—

SECTION I.—Trades, Manufactures, and Occupations, relating to the production of *Food;* which is further subdivided into *Solid Food, Liquid Food,* and *Miscellaneous.*

II.—Trades, Manufactures, and Occupations, relating to *Dress* and *Personal Decoration.*

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* Dr. Vaughan.—"The Age of Great Cities."

† It will be understood that in this list housekeepers only are entered. The chief influence of this fact is upon section vi., a very large number of teachers in the metropolis not being housekeepeers.

SECTION III.—Trades, &c., relating to *Houses* and *Furniture*.
IV.—Trades, &c., relating to *Locomotion* by land and water.
V.—Trades, &c., relating to the production of *Artificial Heat* and *Light.*
VI.—Trades, &c., relating to *Literature, Education, Science,* and the *Fine Arts.*
VII.—Trades, &c., relating to *Medicine, Surgery, &c.*
VIII.—Miscellaneous Trades, Manufactures, and Occupations.

Some explanation will be required under each of these heads. By far the largest number of individuals who exercise any occupation are those engaged in ministering to our daily wants; such employments fall naturally under the three denominations of *Food, Shelter*, and *Clothing.* With respect to one of the most important articles of food, *Bread*, the arrangements for its production do not in the metropolis partake of the character of a large factory. There are 430 dealers who trade in corn. The millers in the vicinity of London deal largely in corn, which they grind and prepare for their customers, the bakers, 2408 in number, each of whom has an oven and arrangements for baking immediately below the shop in which he supplies his customers with bread. Each baker employs one or more journeymen, the number of whom cannot of course be ascertained until the census of this year shall have been taken, and the classified results published; but it may be stated that in 1841, the date of the last population returns, there were 9110 bakers in London, including, of course, masters as well as journeymen. *Meat* is also supplied in a somewhat similar manner. The market salesmen, 158 in number, are the agents between the grazier and the butcher. The London butchers, 1634 in number, either kill their own meat for the supply of their own immediate neighbourhood, or they purchase meat at the markets ready killed and prepared for sale. At the present time about two million head of sheep and cattle are sold every year in Smithfield. In 1841, there were 6450 butchers in London, including journeymen. The skins of the slaughtered animals are collected chiefly in the skin market of Bermondsey, where a class of agents called *Fellmongers* prepare them for the Tanners, whose works exist in considerable numbers in Bermondsey and its neighbourhood. The entrails of sheep, pigs, &c., are transferred to the catgut makers, several of whom have establishments in or near Whitechapel, Smithfield, &c. Billingsgate is the chief market for fish; Leadenhall Market for poultry and game; Newgate Market for eggs and butter; Covent Garden Market for vegetables. (See article "Markets.") In all these, and other articles, there are regular salesmen who act as agents between the growers and producers and the retail dealers.

In the second division of this section we find manufacturing details unequalled in the world for extent and magnificence. The large London Breweries are among the wonders of the metropolis, and we may form some idea of the extent of their operations from the fact, that in 1849-50, Messrs. Meux and Co. consumed 59,617 quarters of malt, and Messrs. Reid and Co. 56,640 quarters, for porter only; while in the same period, for ale and porter Messrs. Barclay and Co. consumed

115,542 quarters; Truman and Co. 105,022 quarters; Whitbread and Co. 51,800 quarters; and other firms in decreasing proportions. In a large brewery lately visited by the writer the quantity of malt wetted during the winter brewing season, every Tuesday and Friday, is 320 quarters, and in the four other days of the week, 230 quarters. There are in this brewery three coppers of the capacities of 350, 500, and 600 barrels. The coal consumed per day is 10 or 12 tons, and the capacity of the largest store vat is 1568 barrels. Admission to these breweries is not difficult, provided the applicant be properly recommended. (See also separate article on "Breweries.")

The produce of these large factories is distributed to the public through the medium of 4416 publicans, whose houses are distinguished by some sign which is often remarkable for its oddness, and the strange collocation of objects, as well as illustrating the loyalty or the prevailing public topic of the time. For example, among the public-house signs we have, as illustrative of loyalty, 66 Crowns, 19 Crown and Anchors, 5 Crown and Cushions, 8 Crown and Sceptres, 48 Rose and Crowns. We have also the Crown and Shears, the Crown and Shuttle, the Crown and Still, the Crown and Sugar Loaf, the Crown and Thistle, and the Crown and Two Chairmen. There are 92 King Georges, either alone or connected with some object more or less incongruous. The sign of the King and Queen occurs 12 times. There are 86 King's Arms and 67 King's Heads, 7 Royal Georges, 2 Royal Sovereigns, 2 Royal Williams, 1 Royal Victoria, 22 Royal Oaks, 5 Queen Victorias, 1 Queen Elizabeth, 1 Queen Charlotte, 1 Queen Catherine, 2 Queen Adelaides, 18 Queen's Arms, 47 Queen's Heads, 16 Prince Alberts, 28 Prince of Wales's, 9 Prince Regents. Then we have these signs again multiplied with the prefix *Old*, such as the Old Crown, the Old Crown and Cushion, the Old George, the Old King's Head, &c. We are also reminded of the times of the late war by finding 13 public-houses dedicated to Admirals, 117 to Dukes, of which 22 are Dukes of Wellington, and 31 Dukes of York. There are 18 Lord Nelsons, and 7 Rodneys. Anchors are also numerous and of various colours, and there are 84 Ships. There are 12 Kings of Prussia, and Pitt has contributed his *head* 9 times, Shakspeare 6 times. But perhaps the most curious are those which set natural history at defiance. There are 7 Flying Horses, 12 Phœnixes, 79 Red Lions, 26 White Lions, 7 Black Lions, and 16 Golden Lions; 18 Green Dragons, 29 Green Men, 5 Elephants and Castles, and 5 Griffins. Then there are Magpies with Stumps, or with Punch Bowls, or Pewter Platters, or Horse Shoes; 21 Nag's Heads, and 2 White Horse and Half-Moons. There are 26 Bull's Heads, 56 Coach and Horses, 21 Cocks, 19 Angels, 9 Angel and Crowns and 2 Angel and Trumpets; 21 Castles, and 6 Jacob's Wells; 65 Grapes, 22 Feathers, 22 Fountains, 26 Rising Suns, 29 Swans, and 26 Horse and Grooms. But we must pause, with the remark, that a glance at the list of public-house signs is amusing, and perhaps has its moral.

The great distillers rank next to the brewers as important manufacturers, and their processes are in many respects the same. There are only 60 distillers and rectifiers in the metropolis, the number being probably limited by the large outlay required for the carrying on of their business, and by the constant presence of the excise.

The large number of grocers and tea-dealers, 2676, will show to what an extent tea and coffee drinking is carried on in the metropolis. The coffee-rooms of London are a great boon to many thousands of persons, who, thirty years ago or less, would have had no other public resort for their leisure hours than the tap-room or parlour of a public-house, or the gallery of a theatre. But in these warm and comfortable rooms they can sit for hours and employ themselves in reading the periodical literature of the day, or the more solid literature which many of these establishments provide.

The sugar which is brought into this country consists entirely of raw or brown sugar. It is converted into white or refined sugar in the sugar refineries, which are situated at Whitechapel and its neighbourhood. These are conducted on a very large scale, and may rank among the most important and interesting manufactories of the kingdom.. Both in a commercial and a scientific point of view, they well deserve a visit.

The number of wine-merchants in London is large; but these are almost exclusively persons who import foreign wines, and dispose of them to their customers. British wines are manufactured by the vinegar-makers, whose operations are conducted on an extensive scale. There are only nineteen vinegar-makers in the metropolis; and the reason why the two articles are associated, is, that the refuse of the British wine manufacture is an essential article in clarifying vinegar, so that in this way the vinegar-maker insures a constant supply of stalks and skins of raisins, &c. (called *rape*).

In our second list, which comprises articles of dress and personal decoration, we may refer the manufacture of four great articles of clothing—cotton, linen, silk, and wool—entirely, or almost so, to the provinces. Cotton and cotton goods are manufactured in Manchester and its neighbourhood; linen at Leeds and the north of Ireland; silk at Derby, Manchester, Macclesfield, Congleton, Leeds, and a few other towns; woollen cloth in the West Riding of Yorkshire, and also in the west of England. Worsted goods are also produced in Yorkshire, hosiery at Liecester, hosiery and lace at Nottingham, crape at Norwich, ribbons at Coventry, silk gloves at Derby, leather gloves at Worcester. Now, when we find in our London list a large number of *manufacturers* of these and other articles, it must be understood that they are either the agents of the country manufacturers, or wholesale or retail dealers in the articles in question. It is true, that, to a certain extent, there are manufacturers of textile fabrics in London; in Spitalfields, for instance, the handloom silkweavers still struggle on, and, with much suffering and privation, maintain a feeble competition with the power-looms of the north. Most of the silk used in the umbrella and parasol manufacture which belongs to London is woven in Spitalfields; but in this, as in many other cases, the employments belong rather to handicraft trades than to manufactures.

Hats are manufactured to a considerable extent in London. The beautiful and curious processes concerned in the manufacture of a beaver hat are fast disappearing before the cheaper and more expeditious processes of the silk hat-maker. The silk plush used for silk hats is largely imported from Lyons, and is also manufactured to a considerable extent in Spitalfields, Coventry, and Banbury. London produces annually about 150,000 *dozen* silk hats; and the number manufactured in Manchester, Liverpool, Birmingham, and Glasgow, is estimated at 100,000 dozen more.

There are 308 dyers in London; but their establishments are very different to the vast establishments of the north. They are for the most part small workshops, where old, faded dresses are revived by being dyed a second time. The leather-dying establishments of Bermondsey are, however, important.

Dunstable is the seat of the strawplat manufacture. The 352 London houses which deal in this article sometimes employ persons to make up the plat; but probably the art of making the plat is unknown in the metropolis.

Sewing-cotton, thread, and silk are all produced in the north. Needles are manufactured almost entirely at Redditch, and pins at Birmingham and a few other places. Sheffield is the great seat of cutlery; Birmingham of the cheaper kinds of jewellery, together with buttons, buckles, clasps and studs, hooks and eyes, and other small articles pertaining to dress. But a large quantity of superior jewellery is manufactured in London. Watches are manufactured in Clerkenwell; and the great subdivision of the watch trade is very curious. There are no less than thirty distinct trades connected with the making of a watch; and these, for the sake of convenience, are clustered together in a sort of colony. Nevertheless, a good deal of the wheel and pinion work of watches and clocks is made in Lancashire.

In our third list some important manufactures belong to the metropolis, but are by no means peculiar thereto. Of the raw materials of building many are imported into London: thus, we get stone from Yorkshire, Scotland, and Portland; slate from Westmoreland and Wales; timber from Norway and Canada; but, as the materials for bricks and tiles are at hand, these are largely manufactured in the vicinity of London. Building is carried on very extensively in and about the metropolis, giving almost constant employment to the bricklayer, the mason, the carpenter and joiner, and the slater. Marble is now worked by machinery; and ornaments in wood are carved by the same means. Flint-glass has always been one of the most important of the London manufactures; but window and plate-glass are most extensively manufactured in the north. The glass for the *Palace of Glass* was manufactured at Chance's extensive works at Oldbury, near Birmingham. There are saw-mills for timber in London. The materials for the painter are, to a certain extent, prepared in London; but the great whitelead-works, colour-works, oil and varnish and turpentine-works exist in other parts of England. Carpets and rugs, grates, fenders, fire-irons, and various implements of iron and brass, plates, dishes, cups, saucers, knives and forks are chiefly produced in Kidderminster, Halifax, Sheffield, Staffordshire, &c. &c.; but there are considerable manufactures of coarse pottery at Lambeth. Floor-cloth and paper-hangings are extensively manufactured in London; as are also tables, chairs, bedsteads, beds, mattresses, glass-frames, and picture-frames. Furniture for hangings, &c., is made almost entirely in the north.

In our fourth list, we may speak of coach-building as a London manufacture; many of the persons concerned therein being congregated in Long Acre, Drury Lane, and the neighbourhood. Railway carriages and railway engineering generally are not confined to London, each company having its own workshops either at the London station, or at some distance from town. Ship-building is carried on somewhat extensively below Bridge, on the banks of the river, together with rope-making and other necessary trades.

The gas companies, entered in our fifth list, are prominent features in London manufactures. (See separate article on "Gas.") A visit to one of the large London gas-works is full of interest. Candle-making has also, of late years, risen into an important manufacture. Price's patent candles are made at a very extensive factory at Vauxhall. They are made from a beautiful white solid fat obtained from palm-oil, which has now become an important article of trade. It is obtained from the western coast of Africa to the extent of upwards of 20,000 tons annually, in exchange for goods of British manufacture; and the cause of humanity requires that this traffic should be encouraged, since it has proved a most important instrument in the reduction of the slave trade, the native Africans being profitably engaged at home in the preparation of the oil; thereby rendering it a matter of interest to retain their services, instead of disposing of them to the slave-dealer.

The coal trade of London is also of great importance, between three and four million tons being introduced every year. A large portion of this is used by the manufacturers of gas; but it is a curious fact, that, although gas-lights are used for street illumination, thereby superseding oil lamps, and gas is commonly used in shops, offices, counting-houses, and even in private dwellings, the consumption of oil for lamps, and of wax and tallow for candles, has increased in a greater proportion than the population. This increase may depend on the greater brilliancy of the streets leading us to be dissatisfied with the amount of light previously thought sufficient within our houses. Certain it is, that our houses are much more brilliantly lighted than they were before the introduction of gas.

The trades and occupations entered under our sixth section are carried on to a much greater extent in London than in the provinces, or indeed in any other part of the world. A visit to one of our great printing offices, or to one of the large bookbinders, will show the amazing extent to which the arrangements and machinery for the mechanical production of books is now carried. At several printing offices arrangements are made for founding the type, for stereotyping, and for printing by steam-driven machinery. At various bookbinding establishments it is not unusual for the whole impression of 1000 copies of an octavo work to be folded, sewed, and handsomely bound in cloth covers in the course of ten or twelve hours. The cloth covers with the gilt lettering, the blind and gilt tooling, are, however, prepared a few days before the sheets have left the printers' hands. The paper used by the printer is not made in London, but a few miles away, where abundance of pure water is to be procured. The same remark applies to writing paper. Account-book makers and vellum binders are distinct from bookbinders properly so called. It will be seen from our list that there are a large number of trades and occupations subsidiary to printing and bookbinding, and it may be stated that the consumption of calico or linen for the cloth cases of books is now very large. This is supplied by Manchester.

Scientific apparatus is also made in large quantities in London, and it is curiously subdivided. Cheap barometers and thermometers are made by Italians, who reside in Leather Lane and the vicinity of Hatton Garden; and in passing through this district one is struck with the poetical names of the makers, such as Albino, Serafino, Calderara, Corti, Negretti, Pastorelli, Tagliabue and Zambra, Somalvico, Gugeri, Grimoldi, Martinelli, and so on. The instruments made by these poetical gentry are of very little scientific value. Compasses and metallic mathematical instruments are made by a distinct set of men. Ivory and box-wood scales and rules occupy another set. Lenses are made in large quantities by machinery at Birmingham and elsewhere. The brass parts of instruments also form a distinct trade. Nautical instrument makers occupy the regions of Wapping, but sellers of instruments and apparatus (who grandly style themselves *opticians*) are scattered over the metropolis.

Musical instrument makers are important personages in London. It is doubtful whether a piano-forte maker would succeed out of the metropolis, but an instrument with the name of a celebrated London maker stamped upon it passes current everywhere. In this case, "warranted London made" is as much a recommendation as "Sheffield made" ought to be to a piece of cutlery.

Steel pens, entered in our list, are almost entirely made at Birmingham. Quill and pen manufacturers still exist, one scarcely knows how, and the sealingwax and wafer trade seems to be threatened with speedy annihilation by the system of adhesive envelopes.

The 10 ticket writers entered in our list are persons whose province it is to write tickets for the shops in large attractive characters, so that "he who runs may read."

We need only remark in our seventh list that the surgical instrument makers of London compete successfully with those of Sheffield.

In our eighth list we have grouped together a number of trades and occupations which do not fall conveniently into any of the preceding divisions. Agricultural instrument makers are only sellers, the instruments themselves being made at Norwich, Colebrook-dale, and elsewhere. Bone dealers, blood driers, and manure manufacturers carry on an important trade, the refuse of this vast metropolis affording abundant raw material for the purpose. Guns and fire-arms are chiefly manufactured at Birmingham: gunpowder is made at mills some distance from London. Fireworks are made in London, and it is surprising, after the repeated disasters which have occured, that the trade is permitted to exist in crowded districts. One firework maker, Joseph Winterburn by name, resides in Providence Buildings; Mrs. Pensa carries on this dangerous trade in Clerkenwell; and three other females work at it in Lambeth. Cigars are made in large quantities in the neighbourhood of Whitechapel, and it is strongly suspected that the makers do not deal exclusively in the leaf of the tobacco plant. Marine store dealers are those who deal in everything which is supposed to exist on board a ship, including bones, rags, and old bottles. They are, in short, dealers in those articles which are of no value because they are not in the right hands. Soap is an important article of London manufacture. Some of the soap makers at Lambeth boil the bones collected by the marine-store dealers, skim off the fat which they use in making soap, and then crush the bones for manure.

There are 1696 merchants resident in the city of London, together with 248 warehousemen. Many of them are wholesale dealers in the articles manufactured in the provinces, and included in former lists.

Our limits will not allow us to proceed with our comments; we, therefore, conclude with the remark, that a large number of females are engaged in pursuits which seem but little adapted to the habits of the fair sex, while men, for the most part, engross trades which would seem well fitted for women. Thus, of the 15 bonnet shape makers only one is a woman. Of the 12 book and card edge gilders two are females, viz. Mrs. Mary Bullwinckle and Mrs. M. H. Page. Of the 15 chiropodists 4 are ladies, and doubtless attend upon ladies who will insist upon wearing tight shoes. Of the 5 fan makers only one is a lady. Of the 116 farriers 6 are females. We find also that Miss Mary Pottle makes military feathers and hair plumes for those dashing fellows who wear them so jauntily. London claims 16 file cutters, and one of them is Miss Mary Hughes. Among the 172 lightermen who ply on the Thames, there are several females. One calls herself Widow Williams, which sufficiently explains that she carries on her husband's trade, which is probably the case with many other female traders. This, however, cannot be the case with Miss Martha Smart, who is a mathematical instrument maker (and why not?). An unmarried lady is also a maker of razor strop paste. The art and mystery of carmine and rouge are appropriately conducted by ladies, as also to a certain extent the art of making artificial flowers;

and that they think highly of their art is evident from the fact that a lady acquaintance of the writer's, on purchasing some of these flowers remarked, that they did not resemble natural flowers. "Oh, no! madam," was the reply, "these are very superior to any that grow!" We find one female entered as a veterinary surgeon! Miss Lockey and Mrs. Massey are watch escapement makers. There are several female wheelwrights, and one female whiting manufacturer. There are also female wig-makers, as there should be. We once knew a female engraver who earned such good wages that, when she married, her husband did not see any reason why he should work too, so he remained idle, and the poor woman had to strive hard to keep the wolf from the door.

TRADERS, MANUFACTURERS, ETC.

I. Food.

Solid.

Agents.—Corn, 3.
Colonial, 21.
Annatto manufacturers, 6.
Arrowroot dealers, 3.
Bacon driers, 8.
Bakers, 2408.
Of these, 96 are biscuit bakers, and 15 are muffin and crumpet bakers.
Bakers' peel maker, 1.
,, biscuit tool maker, 1.
Bolting cloth manufacturer, 1.
Butchers, 1634.
Brokers. — Fruit, 11 — provision, 12—sugar, 21.
Cheese factors and agents, 18.
Cheesemongers, wholesale, 52.
,, retail, 900.
Cocoa-nut merchant, 1.
Confectioners, wholesale, 49.
,, and pastry cooks, 473.
Corn dealers, 430.
,, and flour factors, 133.
,, merchants, 117.
Dining rooms, 301.
Drysalters, 41.
Egg merchants and salesmen, 56.
Farina makers (digestive food), 6.
Fishmongers, 378.
Fruiterers and green-grocers, 1134.
Granary keepers, 19.
Ham and tongue dealers, 93.
,, merchants, 7.
Lard manufacturers, 5.
Maccaroni makers, 2.
Market gardeners, 45.
Mould makers (jelly, &c.), 7.
Orange merchants, 62.
Pepper work, 1.
Pine and grape grower, 1.
Pork butchers and porkmen, 246.
Poulterers, 101.
Preserved fruit importer, 1.
Provision merchants, 77.
Rice merchants, 7.
Salesmen.—Butter, 11.
Carrot, 4.
Cattle, 259.
Fish, 58.
Fruit, 112.
General, 51.
Hay and straw, 24.
Meat, 158.
Potato, 200.
Poultry and game, 22.
Watercresses, 3.
Salt merchants and manufacturers, 13.
Scotch oatmeal factors, 4.
Ship biscuit bakers, 17.
Spice merchants, 22.
Sugar refiners, 40.
Tripe dressers, 52.
Venison dealers, 6.

Liquid.

Agents.—Coffee, 2.
Ale and porter merchants and agents, 82.
Back and vat makers, 11.
Beer retailers, 731.
Brandy merchants, 8.
Brewers, 122.
Brewery agents, 5.
British wine makers, 19.
Brokers.—Tea, 20—wine and spirit, 32—coffee, 5.
Capillaire, and wine and spirit colouring makers, 14.
Chicory importers, 9.
Chocolate and cocoa manufacturers, 15.
Cyder and perry merchants, 17.
Coffee dealers, wholesale, 40.
,, roasters, 16.
,, roaster makers, 3.
,, rooms, 860.
Coopers, 240.
Dairymen and purveyors of asses' milk, 989.
Dantzig spruce importers, 6.
Distillers, 60.
Distillers' chemists, 4.
Filter makers, 9.
Fish sauce makers, 15.
Groat manufacturers, 5.
Grocers, wholesale, 56.
,, and tea dealers, 2676.
Hop factors, 42.
Hop merchants, 43.
Inspector of tea, 1.
Isinglass importers and dealers, 27.
Malsters, 23.
Malt roaster makers, 2.
Mineral water warehouses, 14.
Mustard manufacturers, 15.
Pearl barley manufacturers, 2.
Publicans, 4416.
Soda water and ginger beer makers, 71.
Soda water engine makers, 5.
Tea dealers, wholesale, 135.
Treacle makers, 2.
Vinegar makers, 19.
Whisky merchants, 17.
Wine merchants, 884.
Wine fining makers, 9.
Yeast dealers, 19.

Miscellaneous.

Hotels, inns, taverns, and principal coffee houses, 385.
Lodging and boarding house keepers, 820.
Ice merchants, 7.
,, pail maker, 1.
,, safe maker, 1.
Italian warehouses, 87.

II. Dress and Personal Decoration.

Agents.—Cotton, 6.
Cloth, 4.
Manchester, 25.
Shawl, 2.
Shoe, 6.
Silk, 21.
Woollen, 7.
Army accoutrement makers, 32.
,, clothiers, 48.
Artificial eye makers, 4.
,, leg and arm makers, 4.
Artificial florists, plumassiers, and ostrich feather makers, 91.
Artificial florists' material dealers, 7.
Bandana manufacturers and printers, 10.
Bead and bugle makers and importers, 11.
Beaver cutter, 1.
Berlin warehouses, 96.
Black reviver maker, 1.
Blacking makers, 38.
Blackwell Hall factors (woollen), 29.
Bleachers, 8.
Bleaching powder manufacturer, 1.

Blue manufacturers, 12.
Bombazeen manufacturers, 2.
Bonnet block and stand makers, 2.
Bonnet shape makers, 15.
Boot closer, 1.
,, and shoe factors, 2.
,, ,, makers, 2150.
Boot-top maker, 1.
Brace and belt makers, 42.
Braid makers, 13.
Breeches makers, 31.
Brokers.—Cotton, 7.
Hide, fur, and skin, 8.
Wool, 17.
Indigo, 21.
Buckle maker, 1.
Buckram manufacturer, 1.
Bunting and say manufacturers, 5.
Button and trimming sellers, 28.
Button manufacturers, 30.
Calenderers, 12.
Calico glazers, 4.
,, printers, 30.
,, printers' blockcutters, 2.
Cap makers, fur, cloth, and fancy, 47.
Cap peak and cockade makers, 12.
Cap spring makers, 3.
Childbed linen warehouses, 64.
Clear starchers, 4.
Cloth workers, 19.
Clothes salesmen, 202.
Cochineal merchants, 2.
Comb makers, 43.
Coral merchant, 1.
Coral and jet workers, 5.
Cotton merchants, 12.
,, and cotton yarn manufacturers, 31.
Court plaster makers, 2.
Crape dressers, 4.
,, manufacturers, 10.
Curriers and leather dressers, 172.
Dentists, 277.
Diamond cutters, setters, and workers, 5.
Diamond merchants, 18.
Doll makers, 13.
Dyers, 308.
Embroiderers, 34.
Embroidery silk maker, 1.
Fan makers, 5.
Feather, military, and hair plume makers, 3.
Flannel factors, 9.
,, manufacturers, 13.
Flax merchants, 3.
,, spinners, 8.
Fringe and lace makers, 89.
Fur and skin dressers and dyers, 29.
Fur and skin merchants, 6.
Furriers, wholesale, 21.
,, retail, 144.
Galloon and double makers, 11.
Gauze dresser, 1.
,, manufacturers, 3.
Gilt jewellers, 7.
,, metal worker, 1.
Glove cleaners, 2.
Glovers, wholesale, 17.
,, retail, 49.
Goffered ruche manufacturers, 2.
Gold and silver lacemen, 30.
,, ,, thread makers, 9.
Gold chain makers and jewellers, 29.
Goldsmiths and jewellers, 144.
Haberdashers, wholesale, 18.
,, retail, 280.
Hair dressers and perfumers, 684.
Hair manufacturers (human), 11.
Hair merchants, 4.
,, workers (device), 16.
Hat band makers, 3.
,, block makers, 7.
,, dyers, 5.
,, lining and leather cutters, 6.
,, spring maker, 1.
,, tip maker, 1.
,, varnish maker, 1.
Hatters' bow string makers, 3.
,, furriers, 5.
,, trimming manufacturers, 11.
Hat manufacturers (wholesale), 99.
Hat manufacturers (retail), 376.
Helmet makers, 4.
Hemp and flax merchants, 9.
Hone importers, 2.
Hook and eye makers, 3.
Hosiers, wholesale, 21.
,, and glovers, 297.
Indigo merchants, 8.
Jewellers, 357.
Jewelry case makers, 26.
Lace cleaners, 28.
,, manufacturers, wholesale, 52.
Lacemen, 107.
Lapidaries, 30.
Last makers, 30.
Lasting makers, 2.
Leather cutters, 51.
,, dressers, 69.
,, dyers, 8.
,, enamellers and japanners, 9.
,, factors, 51.
,, sellers, 95.
,, splitter, 1.
,, stainer, 1.
,, stripers, 2.
Linen manufacturers and factors, 55.
Linen drapers, wholesale, 9.
,, ,, retail, 860.
Lint manufacturers, 6.
List dealers, 2.
Mangle and press makers, 13.
Man's mercers, 6.
Marking ink makers, 4.
Masquerade and fancy dress warehouses, 8.
Measuring tape makers, 2.
Milliners, 1024.
Mourning warehouses, 13.
Mourning and wedding ring makers, 5.
Mousseline de laine printers and manufacturers, 2.
Muslin manufacturers, 14.
Needle manufacturers, 22.
Orchil and cudbear makers, 3.
Ostrich feather makers, 21.
Outfitters, 76.
Patten and clog makers, 28.
Pattern drawers, 24.
Pearl stringers, 4.
,, workers, 12.
Perfumes, wholesale, 45.
,, retail, 76.
Pin makers, 15.
Pink saucer maker, 1.
Plush manufacturers, 8.
Putty powder and jewellers' rouge makers, 7.
Razor strop makers, 13.
,, ,, paste makers, 2.
Ready made linen warehouses, 42.
Respirator depôts, 2.
Ribbon dressers, 6.
,, manufacturers, 29.
Robe makers, 9.
Rouge and carmine makers, 3.
Seal makers, 3.
Sewed muslin manufacturers, 17.
Sewing cotton manufacturers, 9.
Sewing silk manufacturers, 9.
Shag manufacturers, 12.
Shawl manufacturers and warehousemen, 55.
Shawl border and fringe makers, 5.
Shirt makers, 56.
Shoe and stay mercers, 6.
,, thread, twine, and canvas manufacturers, 11.
Shroud manufacturer, 1.
Silk dressers, 10.
,, and velvet manufacturers, 110.
Silkmen, 6.
Silk mercers, 91.
,, merchants, 15.
,, printers, 7.
,, purse makers, 4.
,, warehousemen, 18.
,, winders, 2.
Silver thimble makers, 4.
Slipper manufacturers, 10.
Slop sellers, 86.
Smelling bottle makers, 8.
Snuff and fancy box makers, 27.
Spangle and tinsel makers, 5.
Spectacle makers, 12.
Starch makers, 9.
Stay and corset makers, 272.
,, lace makers, 4.
,, and shoe makers, wholesale, 9.
Stick makers, 7.
Stock makers, 25.
Straw, Leghorn, and Tuscan hat warehouses, 352.
Straw, Leghorn, and Tuscan hat cleaners and pressers, 14.
Straw, Leghorn, and Tuscan plat dealers, 20.
Stuff manufacturers, 30.
Tabinet warehouses, 2.
Tailors, 2641.
Tailors' fashions, publishers of, 3.
Tanners, 55.
Tassel and fringe mould makers, 6.
Teeth dealers, 7.
Thread manufacturers, 7.
Tooth powder makers, 3.
,, ,, box makers, 1.
Trimming manufacturers and sellers, 157.
Truss makers, 41.

Umbrella and parasol makers, 132.
Umbrella furniture makers, 5.
,, silk makers, 9.
Upholsterers, 439.
,, warehousemen, 5.
Valentia warehouse, 1.
Velvet manufacturers, 6.
,, wire drawers, 3.
Wadding and cotton warehouses, 10.
Watch makers, 697.
,, balance makers, 2.
,, cap makers, 7.
,, case makers, 52.
,, dial plate makers and finishers, 17.
,, and clock dial silverer, 1.
,, engravers, 9.
,, escapement makers, 18.
,, finishers, 8.
,, fuzee makers, 4.
,, and case gilders, 21.
,, and clock glass makers, 16.
,, hand makers, 15.
,, jewellers, 32.
,, joint finishers, 3.
,, key makers, 3.
,, material dealers, 9.
,, motion makers, 26.
,, pallet jeweller, 1.
,, ,, makers, 3.
,, pendant makers, 4.
,, pinion makers, 2.
,, secret springers, 39.
,, spring makers, 11.
,, and clock tool makers and dealers, 13.
,, wheel makers, 7.
Water proofers, 26.
Whalebone cutters, 13.
Widows' cap makers, 7.
Wig makers, 19.
,, spring maker, 1.
Wool merchants, 16.
,, staplers, 27.
Woollen drapers, 97.
,, warehousemen, 108.
Worsted manufacturers, 21.
Yarn merchants, 14.

III. HOUSES AND FURNITURE.

Agents.—Carpet, 13.
Stone, 5.
Basket makers, 93.
Bath makers, 15.
Bed and mattress makers, 35.
,, sacking makers, 13.
,, screw maker, 1.
Bedstead makers, 54.
Bellows makers, 8.
Bent timber manufacturers, 16.
Billiard and bagatelle table makers, 16.
Birch and alder dealers, 2.
Birch and heath broom makers, 5.
Bird and beast stuffers, 28.
Bird-cage makers, 16.
Birmingham and Sheffield agents, 24.
Birmingham and Sheffield warehouses, 22.
Blind spring-roller manufacturers, 4.
Bottle merchants and dealers, 63.
Brass founders, 140.
,, manufacturers, 55.
,, turners, 11.
Brick agents, 7.
,, and tile makers, 31.
,, ,, merchants, 21.
,, mould makers, 2.
Bricklayers, 387.
Bristle merchants, 8.
Britannia metal manufacturers, 2.
British plate mannfacturers, 9.
Brokers.—Ivory, 2.
Metal, 16.
Timber, 27.
Brush makers, 321.
Bug destroyers, 2.
Buhl cutters, 13.
Builders, 817.
,, of portable houses for exportation, 2.
Building material dealers, 32.
Cabinet carvers, 45.
,, inlayers, 7.
,, makers, 516.
,, ,, fancy, 36.
Cane dealers, 14.
,, workers, 13.
Card and cardboard makers, 22.
Carpenters, 1066.
Carpet and rug warehouses, 86.
,, planners, 6.
Carpet-bag frame maker, 1.
,, makers, 15.
Carvers and gilders, 318.
Chasers, 49.
Chimney sweepers, 33.
Chimney sweepers' machine makers, 3.
China dealers, foreign and fancy, 5.
China mounter, 1.
,, painters, 2.
,, glass, &c. rivetters, 8.
,, glass, and earthenware dealers, 387.
Chiropodists, 15.
Clay merchants, 4.
Clock makers, 74.
,, case makers, 16.
Cock founders, 6.
Cocoa nut fibre importers, 8.
Coffin furniture makers, 7.
Colour manufacturers, 43.
Composition ornament makers, 14.
Coppersmiths and braziers, 86.
Copper companies and merchants, 20.
Cork cutters, 81.
,, ,, knife makers, 2.
Curiosity dealers, 51.
Curtain rod manufacturer, 1.
Cutlers, 172.
Desk and dressing case makers, 97.
Door plate makers, 5.
,, spring makers, 3.
D'oyley warehouse, 1.
Electro gilders and platers, 24.
Electrotypists, 3.
Embossers, 20.
Enamellers, 28.
Fan and sky light makers, 7.
Feather dealers, 7.
,, merchants, 8.
,, manufacturers, 26.
,, purifiers, 9.
Fender and fire iron makers, 11.
Fireproof box makers, 14.
Fire-wood dealers, 32.
Flock manufacturers, 17.
Floor cloth manufacturers, 35.
Foreign and fancy goods importers, 103.
French polish manufacturers, 2.
French polishers, 72.
Fuel manufacturers (patent), 4.
Furniture brokers and fixture dealers, 475.
Furniture japanners and painters, 13.
Furniture printers, 8.
General dealers in hardware, 26.
" factors, 17.
Glass benders, 5.
,, cutters, 60.
,, drillers, 2.
,, engravers, 9.
,, grinders, 4.
,, manufacturers, 52.
,, mounters, 5.
,, shade makers, 18.
,, stainers, 25.
Glazier's diamond makers, 7.
Glue makers, 11.
Gold and silver beaters, 68.
,, ,, burnishers, 7.
,, ,, casters, 6.
,, ,, mounters, 5.
,, ,, piercers, 6.
,, ,, wire drawers, 11.
,, cutters, 21.
,, size makers, 4.
,, swivel makers, 4.
,, weavers, 3.
Hair merchants, 4.
Hand rail makers (patent), 2.
Hand screw makers, 3.
Hardwaremen, wholesale, 14.
,, retail, 37.
Hearth stone makers, 3.
Hempen cloth makers, 2.
Hinge (patent rising) makers, 4.
Horsehair merchants and manufacturers, 38.
Hot water apparatus makers, 21.
Hydrostatic bed makers, 6.
India mat warehouse, 1.
,, rubber manufacturers, 21.
Inlayer (flooring), 1.
Iron and brass bedstead makers, 25.
Ironmongers, wholesale, 68.
,, retail, 420.
Iron and tin plate workers, 27.
Ivory, hard wood, and tortoise shell dealers, 16.
Ivory turners, 66.
,, workers and cutters, 14.
Japanners, 44.
Lacquerers, 2.
Lath renders, 25.
Lead merchants, 41.
,, pipe manufacturers, 4.
Leather cutters, 51.
,, dressers, 69.
,, dyers, 8.
,, enamellers and japanners, 9.
,, factors, 51.
,, gilders, 6.
,, japanners, 5.
,, sellers, 95.
Lock (patent) makers, 12.

Locksmiths and bell hangers, 127.
Looking glass makers, 51.
,, ,, silverers, 4.
Lucifer match makers, 18.
,, ,, box makers, 3.
Mahogany merchants, 31.
Matting and hassock makers, 8.
Mattress makers, 8.
Mohair manufacturers, 2.
Mop makers, 4.
Nail makers, 15.
Ormolu frame makers, 3.
Paint manufacturers, 11.
Painters and glaziers, 302.
,, paper hangers, and house decorators, 164.
Paper-hanging manufacturers and hangers, 192.
Papier-maché manufacturers, 14.
Pewterers, 55.
Picture and looking glass frame makers, 89.
Piece brokers, 21.
Pipeclay merchants, 5.
Plasterers, 53.
Plasterers' hair manufacturers, 8.
Plaster of Paris manufacturers, 10.
Plate case makers, 7.
,, polisher, 1.
,, glass manufacturers, 36.
Platers, 14.
Plumbers, 820.
Polishing paste makers, 4.
Potters, wholesale, 28.
Pump makers, 26.
Quilting warehouse, 1.
Roasting jack makers, 14.
Roman cement makers, 29.
Rout furnishers, 4.
Rug manufacturers, 29.
Russia mat warehouses, 8.
Sash line makers (patent), 3.
Sash makers, 9.
Saw mills, 67.
Scagliola manufacturers, 7.
Sheffield and plated warehouses, 29.
Silver polishers, 4.
,, spoon and fork makers, 10.
Silversmiths, 130.
Size manufacturers, 7.
Slate merchants, 29.
Slaters, 13.
Small ware manufacturers, 2.
Smiths, 295.
Stencil cutter, 1.
Stencillers, 6.
Stone and marble masons, 164.
,, ,, merchants, 57.
Stove and range makers, 92.
Table cover makers, 17.
Table knife makers, 9.
Tassel and fringe mould makers, 6.
Tea canister makers, 4.
Teapot handle makers, 3.
Tea tray makers, 6.
,, urn makers, 11.
Timber merchants, 252.
Time and hour glass maker, 1.
Tin foil maker, 1.
,, merchants, 9.
,, plate workers, 237.
Transparent blind makers, 7.
Turners in general, 207.
Varnish makers, 73.
Vegetable ornament cutter, 1.
Veneer cutters, 7.
Water closet makers, 16.
Water companies, 9.
Water gilders, 19.
Water pipe makers, 13.
White lead manufacturers, 25.
Whiting manufacturers, 20.
Window blind makers, 136.
,, glass cutters, 38.
,, ,, merchants and manufacturers, 58.
Wine cooler makers, 2.
Writers and gilders on glass, 13.
Writers and grainers, 107.
Zinc merchants and workers, 68.

IV. Locomotion.

Anchorsmiths and chain cable makers, 19.
Axle tree makers, 13.
Blanket and horse cloth warehouses, 9.
Boat and barge builders, 54.
Bridle cutters, 6,
Bridle, bit, stirrup, and spur makers, 9.
Child's carriage makers, 2.
Coach and carriage lamp makers, 20.
Coach and cart grease manufacturers, 16.
Coach body makers and benders, 3.
Coach and harness makers, 263.
Coach beaders, 2.
,, brokers, 8.
,, carvers, 7.
,, ironmongers, 12.
,, draughtsmen, herald painters, and japanners, 53.
,, joiners, 6.
,, painters, 24.
,, platers, 21,
,, smiths, 43.
,, spring makers, 20.
,, trimmers, 3.
Collar makers (horse), 14.
Farriers, 116.
Fire-engine makers, 6.
Funeral coach masters, 12.
Harness makers, 50.
,, polish makers, 4.
Horse and carriage repositories, 11.
Horse dealers, 32.
,, slaughterers, 8.
Iron steam-boat and ship builders, 6.
Job masters, 172.
Lightermen, 172.
Livery stable keepers, 191.
Mariners and pilots, 37.
Mast, &c. makers, 51.
Pedometer maker, 1.
Railway signal maker, 1.
Riding schools, 7.
Road and dust contractors, 5.
Rocking horse makers, 3.
Rope, line, and twine manufacturers, 117.
Rubbish carters, 34.
Saddlers, 240.
,, ironmongers, 11.
,, tree makers, 13.
Sail cloth factors, 28.
,, makers, 51.
Salesmen, hay and straw, 24.
Ship block makers by machinery, 2.
Ship breakers, 5.
,, builders, 22.
,, carvers, 3.
,, chandlers, 32.
,, hearth makers, 5.
,, joiners, 10.
,, modeller, 1.
,, owners, 58.
,, riggers, 4.
,, smiths, 35.
,, surveyors, 7.
,, wrights, 28.
,, tank makers, 8.
Shipping butchers, 20.
,, biscuit bakers, 17.
Steam engine boiler makers, 13.
,, and navigation companies, 46.
Tow yarn maker, 1.
Travellers, commercial, 688.
Trunk and packing case makers, 132.
Veterinary surgeons, 121.
Wharfingers, 104.
Wheelwrights, 186.
Whip makers, 47.
,, mounters, 3.
Windlass makers, 3.

V. Artificial Heat and Light.

Agents.—Coal, 5.
Brokers.—Oil, 14.
Candle mould makers, 4.
Charcoal makers and dealers, 9.
Coal dealers, 301.
,, dust makers, 2.
,, factors, 25.
,, merchants, 688.
,, shovel maker, 1.
Cocoa nut lamp oil and candle makers, 2.
Coal (also corn) measure makers, 7.
Cotton and rush makers, 8.
Gas apparatus makers, 23.
,, burner makers, 8.
,, fitters, 207.
,, lantern makers and fitters, 5.
,, light companies, 24.
,, meter makers, 12.
,, pipe makers, 13.
Gasometer maker, 1.
Insurance companies, 162.
Lamp makers and oil warehouses, 59.
Lamp, lustre, and chandelier manufacturers, 45.
Lamp cotton makers, 5.
Lantern leaf and horn plate manufacturers, 2.
Lighthouse lamp makers, 2.
Lucifer match makers, 18.
,, ,, box makers, 3.
Melters and tallow chandlers, 49.
Melters' utensil maker, 1.
Naphtha distillers, 8.
Oil merchants and factors, 101.
,, and colour men, 645.
Spermaceti refiners, 4.
Turpentine and tar distillers, 11.

Wax bleachers, 10.
,, and tallow chandlers, 216.

VI. LITERATURE, EDUCATION, SCIENCE, FINE ARTS.

Account book makers, 33.
Agents.—Paper, 9.
Alabaster warehouses, 4.
Artists' colourmen, 38.
Barometer and Thermometer makers, 36.
Bill sticker, 1.
Black borderers, 9.
Black lead importers and manufacturers, 15.
Black lead pencil makers, 28.
Book and card edge gilders and marblers, 12.
Book edge lock and clasp makers, 10.
Bookbinders, 266.
Bookbinders' cloth makers, 4.
,, leather seller, 1.
,, plough knife maker, 1.
,, press makers, 2.
,, tool cutters and engravers, 18.
Booksellers in general, 774.
,, Agricultural, 2.
,, Architectural, engineering, and scientific, 5.
Booksellers, botanical, 4.
,, foreign, 27.
,, medical, 6.
,, theological, 9.
Bronze powder makers, 5.
Bronzists, 13.
Camel hair pencil makers, 5.
Chemical apparatus makers, 10.
,, stopperers, 11.
Chemists, manufacturing, 62.
Copper plate makers, 18.
,, ,, printers, 61.
Die sinkers, 38.
Draughtsmen, lithographic, zincographic, and carriage, 25.
Engravers, 437.
,, heraldic, 5.
,, historical, 10.
,, map, 11.
,, seal, 55.
,, wood, 35.
Ever-pointed pencil makers, 4.
Fancy repositories, 58.
Globe makers, 8.
Glyphographer, 1.
Herald painters, 19.
Hot pressers, 19.
Hydrometer and saccharometer makers, 7.
Ink makers (writing), 36.
Inkstand makers, 10.
Letter cutters, 27.
Libraries, 80.
Lithographers, 132.
Lithographic press makers, 7.
Manifold writer makers, 13.
Map and chart sellers and publishers, 22.
Map dissector and puzzle maker, 1.
Map and print colourers, 25.
,, mounters, 8.
Mathematical instrument makers, 78.
Medallists, 14.
Millboard makers, 5.
Mineralogists, 2.
Modellers, 25.
Music copyists, 4.
,, engravers and printers, 8.
,, plate manufacturer, 1.
,, printers, 11.
,, smiths, 8.
,, and musical instrument sellers, 116.
Musical box makers and importers, 4.
Musical instrument makers, 84.
Ditto string makers, 18.
Ditto reed maker, 1.
Ditto tube maker, 1.
Nautical instrument makers, 12.
Newspaper and advertisement agents, town and country, 24.
Newsvenders, 222.
Optical braziers, 2.
,, turners, 4.
Opticians, 139.
Organ builders, 35.
,, metal pipe makers, 3.
Paper cutting machine maker, 1.
,, makers and warehouses, 33.
,, mould makers, 4.
Parchment and vellum makers, 13.
Pasteboard makers, 7.
Pianoforte makers, 191.
Pianoforte feet cutters, 6.
Pianoforte hammer and damper cloth manufacturer, 1.
Pianoforte hammer rail makers, 5.
Pianoforte key makers, 9.
,, pin makers, 2.
,, silkers, 5.
,, tuners, 23.
Picture dealers and importers, 75.
Picture restorers and cleaners, 36.
Plaster cast figure makers, 11.
Pocket book makers, 38.
,, ,, lock makers, 2.
Print cutters, 2.
,, sellers, 77.
Printers, 553.
,, numerical, 1.
,, auctioneers, 5.
,, blanket makers, 2.
,, ink makers, 22.
,, joiners and material dealers, 17.
,, press makers, 14.
,, smiths, 10.
,, wood type cutter, 1.
Quill and pen manufacturers, 13.
Rule makers, 14.
Ruling machine maker, 1.
Schools (private), 830.
Sculptors, 66.
Sealing wax and wafer makers, 33.
School slate makers, 6.
Stationers (fancy) and envelope makers, 60.
Stationers, wholesale, 139.
,, retail, 624.
Steel, &c. penmakers, 27.
Stereotype founders, 10.
Teachers of dancing, 58.
Teachers of drawing, 13.
,, elocution, 4.
,, fencing, 2.
,, languages, 55.
,, mathematics, 7.
,, music, 258.
,, navigation, 3.
,, writing, 15.
Telescope makers, 7.
Terra cotta manufacturers, 2.
Ticket writers, 10.
Tracing paper makers, 9.
Type founders, 16.
Vellum binders, 20.

VII. MEDICINE, SURGERY, &c.

Anatomical preparer, 1.
Bougie and catheter makers, 5.
Brokers (drug), 22.
Chemists and druggists, 748.
Chiropodists, 15.
Cuppers, 12.
Dentists, 277.
Drug grinders, 8.
Druggists, 76.
Herbalists, 21.
Leech importers, 12.
Medical galvanists, 2.
,, glass dealers, 13.
,, labellers and fitters, 11.
,, plaster makers, 8.
Medicine chest makers, 3.
Metallic capsule maker, 1.
Midwives, 5.
Oculists, 6.
Patent medicine warehouses, 38.
Physicians, 355.
Pill box makers, 9.
Surgeons, 1806.
Surgical instrument makers, 71.
Teeth dealers, 7.

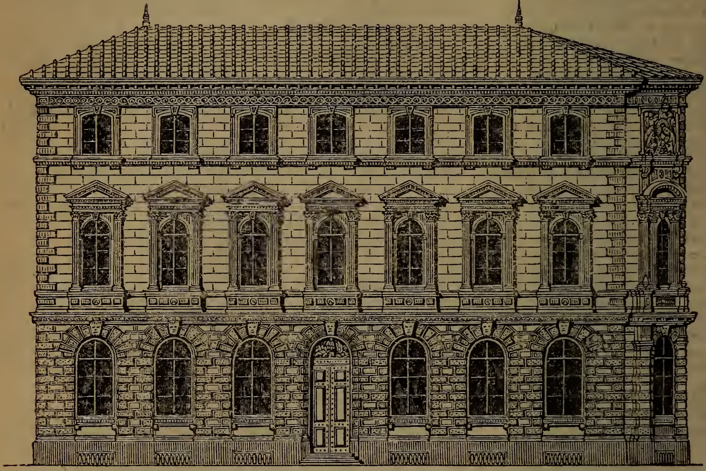
VIII. MISCELLANEOUS.

Agents.—Alum, 6.
Colour, 2.
Metal, 8.
Mineral and mining, 19.
Tin and tin plate, 4.
Agricultural implement makers, 13.
Assayers, 3.
Awl blade makers, 2.
Backgammon board makers, 2.
Black (Frankfort) manufacturers, 6.
Bladder dealer, 1.
Blood drier, 1.
Blowing machine maker, 1.
Bone dealers, boilers, and crushers, 16.
Bullion and jewel brokers, 4.
Brokers.—Colonial, 74.
India, 29.
Indigo, 21.
Rag, 2.
Russia, 35.
Bullion dealers, 11.
Busk maker, 1.
Canteen makers, 2.
Chandlers' shops, 195.
Cigar and tobacco importers, 109.
Clay merchants, 4.
Coffin furniture makers, 7.
Congreve rocket maker, 1.

Cotton waste merchants, 5.
Crane manufacturer, 1.
Cricket bat, ball, and stump makers, 11.
Dutch rush importers, 4.
Emery and glass paper makers, 14.
Engine turners, 28.
Engineers, Mechanical, 301.
,, Civil, 155.
Farmers, 6.
Fellmongers, 12.
Felt makers (patent), 8.
File cutters, 16.
Firework makers, 11.
Fishing tackle makers, 43.
Flatting mills, 8.
Grindery dealers, 37.
Gaugers' instrument makers, 3.
Gun and pistol makers, 85.
Gun barrel makers, 4.
,, ,, prover, 1.
,, carriage makers,
,, case makers, 8.
,, flint maker, 1.
,, lock makers, 4.
,, ,, polishers, 6.
,, stock makers, 3.
,, makers' tool dealer, 1.
,, wadding makers, 6.
Gunpowder manufacturers, 9.
,, flask makers, 2.
Gutta percha warehouses, 17.
Harpoon makers, 2.
Heel ball makers, 3.
Hemp and flax tackle maker, 1.
,, ,, merchants, 9.
Hoop merchants and benders, 10.
Horn and bone merchants, 8.
,, pressers, 3.
Horticultural builders, 20.
Hose makers, 3.
Hydraulic machine makers, 5.
Inspectors of weights and measures (for the City), 6.
Iron chain maker, 1.
Iron fence and hurdle makers, 11.
Iron founders, 119.
Iron founders' pattern makers, 4.
Iron and steel merchants and agents, 105.
Ladder makers, 4.
Lamp black makers, 9.
Land surveyors, 30.
Lathe and tool makers, 21.
Lead ash melters, 2.
Leash manufacturer, 1.
Leather bottle maker, 1.
Leather pipe and bucket makers, 12.
Lime merchants, 27.
Lodging and boarding house keepers, 820.
Loom makers, 2.
Lunatic asylum proprietors, 12.
Machine rulers, 35.
,, strap makers, 8.
Machinists, 61.
Manure merchants and manufacturers, 32.
Marine store dealers, 92.
Meerschaum pipe importers, 6.
Melting pot and crucible makers, 11.
Merchants, 1696.
Metal perforators, 7.
,, warehouses, 29.
Metallic hole maker, 1.
Meters, 2 (one for fruit).
Millboard, paper and hat, &c. box makers, 26.
Millers, 48.
Mill makers, 14,
Millstone makers, 4.
Millwrights, 32.
Mining companies, 94.
Mother of pearl manufacturers, 6.
Nursery and seedsmen, 110.
Oil bag maker, 1.
,, cake merchant, 1,
,, refiners and seed crushers, 12.
,, of vitriol manufacturers, 11.
Ordnance store manufacturer, 1.
Oven builders, 9.
Packers, 13.
Packing case makers, 35.
Paper bag maker, 1.
Paviors, 26.
Pawnbrokers and silversmiths, 297.
Percussion cap makers, 8.
Pitch and tar makers, 7.
Plane makers, 15.
Platina smiths, 2.
Powder barrel maker, 1.
Quicksilver merchant, 1.
Rag merchants, 75.
Reed and stay makers, 4.
Refiners of antimony, 3.
,, gold and silver, 30.
Refining powder makers, 5.
Rod merchants, 4.
Sack and bag makers, 31.
Sack collectors and sack hire warehouses, 7.
Saltpetre refiners, 3.
Sand merchants, 9.
Savings banks, 30.
Saw makers, 35.
Scale and weight makers, 68.
Scale board makers, 9.
Seed crushers, 10.
,, factors, 3.
,, merchants, 13.
Seedsmen and florists, 53.
Servants' registry offices, 15.
Shot manufacturers, 3.
,, pouch and belt maker, 1.
Skin and hide merchants and salesmen, 23.
Skinners, 15.
Snuff manufacturers, 16.
Soap makers, 58.
Soap frame maker (patent metallic), 1.
Soda merchant, 1.
Soda manufacturer, 1.
Sponge dealers and merchants, 19.
Stave merchants, 5.
Steel workers, 4.
Sugar iron mould makers, 2.
Surveyors, 294.
,, of pavements, 18,
,, of taxes, 12.
Sword cutlers, 14.
Tan dealers, 2.
Tarpaulin manufacturers, 19.
Tobacco manufacturers, 65.
Tobacconists, 997.
Tobacco pipe makers, 60.
,, ,, mould maker, 1.
Tool grinder and polisher, 1.
Toolmakers and dealers, 71.
Toy dealers, 107.
Toy makers (tin, pewter, gilt, gun and drum), 20.
Tube drawers, 12.
Undertakers, 420.
Vice makers, 2.
Warehouse keepers, 17.
Warehousemen, 248.
Well sinkers, 5.
Willow square makers, 5.
Wine coopers, 57.
Wire cartridge makers, 2.
,, ribbon maker, 1.
,, drawers, 19.
,, rope makers, 4.
,, workers and weavers, 85.
Wool merchants, 16.
,, staplers, 27.

ASSURANCE OFFICES.

Assurance Offices exist to some considerable extent in London; some are ancient, and most of them extremely wealthy. Assurance on human life is a contract by which a certain amount of capital is secured at the expiration of the life of the insured, or taken at stipulated periods, either by the payment of a specified sum at the time of effecting the assurance, or by the annual payment of an agreed sum, according to age or period. Some offices take insurance on ships, both British and foreign. These companies conduct their business upon the fairest and most liberal principle. For further description, see also pp. 111–113. The accompanying example of the Imperial Fire Office was designed and carried out by Mr. Gibson, architect.



IMPERIAL ASSURANCE OFFICE, BETWEEN BROAD STREET AND THREADNEEDLE STREET.

TABLE OF LIFE ASSURANCE COMPANIES IN LONDON (1851).

[*The Premiums, with very few exceptions, are with Profits.*]

TITLE AND OFFICES.	ACTUARY, OR SECRETARY.†	When Founded.	ANNUAL PREMIUM FOR ASSURIN £ 100.				
			Age 20	Age 30	Age 40	Age 50	Age
Aberdeen, 36, Essex St., Strand.	James Davidson, Esq.†	1825	1 18 3	2 9 6	3 7 9	4 19 9	
Ægis, 41, Moorgate Street.	William Scott, Esq.†	1849	1 17 5	2 8 1	3 3 11	4 9 8	
Albert, 11, Waterloo Place.	H. W. Smith, Esq.	1838	1 17 9	2 7 5	3 2 10	4 9 3	6 17
Albion, New Bridge St., Blkfrs.	John Le Cappelain, Esq.	1805	1 18 3	2 9 6	3 7 9	4 19 9	
Alfred, 7, Lothbury.	Charles Jellicoe, Esq.	1839	2 3 7	2 13 5	3 7 11	4 10 8	6 7
Alliance, Bartholomew Lane.	F. A. Engelbach, Esq.	1824	1 16 11	2 9 2	3 6 6	4 14 2	7 14
Amicable, Sergeants' Inn, Flt. St.	Thomas Galloway, Esq.	1706	2 0 6	2 10 6	3 5 0	4 16 6	7 6
Anchor, 67, Cheapside.	T. Bell, Esq.	1842	1 19 6	2 9 9	3 6 6	4 10 9	7 4
Argus, 39, Throgmorton St., and 14, Pall Mall.	Professor Hall.	1833	1 11 10	2 0 7	2 14 10	4 0 11	
Asylum, 72, Cornhill.	G. Farren, *Res. Direc.*	1824	1 11 9	2 2 0	2 17 1	4 2 0	6 10
Atlas, 92, Cheapside.	Charles Ansell, F.R.S.	1808	2 3 7	2 13 5	3 7 11	4 10 8	6 7
Australasian, &c., Leadenhall St.	E. Ryley, Esq.	1839	1 17 1	2 8 2	3 4 0	4 11 8	6 13
Britannia, 1, Prince's St., Bank.	Andrew Francis, Esq.†	1837	2 0 0	2 9 10	3 6 6	4 15 6	7 7
British, 2, King St., Cheapside.	John Reddish, *Manager.*	1847	1 18 9	2 8 5	3 4 6	4 11 9	
British Commercial, 35, Cornhill.	Francis F. Sanderson.†	1820	2 1 5	2 10 9	3 4 6	4 11 0	6 13
British Empire Mutual, 37, New Bridge Street, Blackfriars.	W. S. Gover, Esq.	1846	1 17 6	2 8 3	3 4 2	4 11 1	7 4
British Mutual, 17, New Bridge Street, Blackfriars.	Charles J. Thicke, Esq.†	1844	1 15 8	2 1 6	2 14 9	4 1 7	6 6
British Provident, 4, Chatham Place, Blackfriars.	C. T. Rouse, Esq.†	1850	1 16 10	2 7 8	3 5 1	4 15 11	7 10
Caledonian, 27, Moorgate Street.	E. F. Sealy, Esq., *Man.*	1805	1 19 5	2 9 10	3 4 2	4 7 0	6 15
Cambrian and Universal, 61, Moorgate Street.	Thomas Walker, Esq.	1849	1 15 6	2 7 4	3 4 2	4 10 8	6 19
Catholic, 8, New Coventry Street.	W. H. Archer, Esq.	1846	1 17 3	2 8 2	3 5 10	4 10 4	7
Church of England, Lothbury.	William Emmens, Esq.†	1840	1 17 4	2 6 10	3 3 6	4 13 4	7 7
City of Glasgow, 120, Pall Mall.	Archibald Borthwick, Esq.	1838	1 19 5	2 9 9	3 4 6	4 8 3	6

ASSURANCE OFFICES.	ACTUARY, OR SECRETARY.†	When Founded	ANNUAL PREMIUM FOR ASSURING £ 100.				
			Age 20	Age 30	Age 40	Age 50	Age 60
City of London, 2, Royal Exchange Buildings.	G. J. Farrance, Esq.	1845	1 18 3	2 7 9	3 3 2	4 10 2	6 18 4
Clergy Mutual, 41, Parliament St.	Charles Ansell, F.R.S.	1829	1 15 0	2 6 4	3 2 2	4 7 4	7 1 6
Clerical, Medical, &c., 99, Great Russell St., Bloomsbury.	G. H. Pinckard, Esq.	1824	2 0 6	2 10 4	3 3 8	4 7 3	6 7 2
Colonial, 4 A, Lothbury.	W. T. Thomson, Esq.	1846	1 18 4	2 9 4	3 5 6	4 13 0	7 7 1
Commercial and General, 112, Cheapside.	James Daniel, Esq.†	1841	1 19 6	2 9 9	3 6 6	4 10 9	7 4 6
Consolidated, &c., 45, Cheapside.	William Clarke, Esq.	1846	1 16 7	2 7 11	3 3 9	4 8 9	7 1 10
Crown, 33, New Bridge St., Blkfrs.	J. M. Rainbow, Esq.	1825	1 19 11	2 10 4	3 4 7	4 8 11	6 7 2
Defender, 34, New Bridge St., do.	George Howard, Esq.	1842	1 16 7	2 7 5	3 4 10	4 10 8	6 15 6
Eagle, 3, Crescent, New Bridge Street, Blackfriars.	Charles Jellicoe, Esq.	1807	2 1 7	2 10 8	3 5 3	4 11 4	6 17 4
Economic, 6, New Bridge St., do.	J. J. Downes, F.R.A.S.	1823	1 14 7	2 4 3	2 19 9	4 7 6	6 7 5
Edinburgh, 11, King William Street, City.	C. Staniforth, *Res. Direc.*	1823	1 17 4	2 7 7	3 3 2	4 9 0	6 15 8
Engineers', &c., 345, Strand.	Frederick Laurence, Esq.	1848	1 19 2	2 9 3	3 4 9	4 12 1	7 1 3
English and Cambrian, 9, New Bridge Street, Blackfriars.	C. W. Bevan, *Manager.*	1850	1 16 11	2 9 0	3 5 7	4 13 10	6 18 2
English and Scottish Law, 12, Waterloo Place.	J. Hill Williams, Esq.	1839	1 19 6	2 9 9	3 6 6	4 10 9	7 4 6
English Widow's Fund, Fleet St.	Thomas Walker, B.A.	1847	1 14 8	2 4 4	2 19 9	4 8 0	6 11 10
Equitable, Bridge St., Blackfrs.	Arthur Morgan, F.R.S.	1762	2 3 7	2 13 5	3 7 11	4 10 8	6 7 4
Equity & Law, Lincoln's Inn Flds.	J. J. Sylvester, F.R.S.	1844	1 18 3	2 8 10	3 4 6	4 10 9	
European, 10, Chatham Pl., Blkfrs.	W. B. Ford, Esq.†	1819	1 18 3	2 8 0	3 3 6	4 8 3	6 13 3
Family Endowment, 12, Chatham Place, Blackfriars.	William Lewis, Esq.	1835	1 17 9	2 9 7	3 5 9	4 10 6	6 7 11
General, 62, King William St.	David Oughton, Esq.	1837	1 18 2	2 8 5	3 3 7	4 10 3	6 13 0
General Benefit, 4, Farringdon St.	John Brydie, Esq.†	1820	1 14 7	2 4 3	2 19 9	4 8 0	7 0 7
Globe, Pall Mall, and Cornhill.	Fred. Hendricks, Esq.	1799	2 3 7	2 13 5	3 7 11	4 10 8	6 7 4
Great Britain, Waterloo Place, and King William St., City.	A. R. Irvine, *Man. Direc.*	1844	2 1 9	2 11 4	3 7 10	4 17 8	
Gresham, 37, Old Jewry.	T. A. Pott, Esq.†	1848	1 18 8	2 8 3	3 3 8	4 10 11	6 19 3
Guardian, 11, Lombard Street.	Griffith Davies, F.R.S.	1821	2 1 0	2 10 7	3 5 0	4 8 0	6 7 2
Hand-in-Hand, 1, New Bridge Street, Blackfriars.	James M. Terry, Esq.	1836	2 3 7	2 13 5	3 7 11	4 10 8	6 7 4
Imperial, 1, Old Broad Street.	Samuel Ingall, Esq.	1820	2 3 7	2 13 5	3 7 11	4 10 8	6 7 4
India & London, King William St., and 14, Waterloo Pl.	A. R. Irvine, *Manager.*	1846	1 13 11	2 2 1	2 16 4	4 1 11	6 8 3
Indisputable, 72, Lombard St.	D. Alison, Esq.†	1848	1 17 4	2 8 10	3 5 0	4 10 7	7 4 9
Industrial & General, 2, Waterloo Place.	F. G. P. Neison, Esq.	1849	1 17 5	2 7 5	3 2 10	4 8 11	6 15 8
Kent Mutual, Old Jewry.	W. E. Hillman, Esq.	1849	1 15 3	2 5 8	3 2 5	4 12 0	7 4 6
Law Life, Fleet Street.	W. S. Downes, Esq.	1823	2 3 7	2 13 5	3 7 11	4 10 8	6 7 4
Legal & Commercial, 73, Cheapside	T. W. Farnell, Esq.	1845	1 16 10	2 7 8	3 5 1	4 15 10	7 10 8
Legal & General, 10, Fleet St.	T. R. Edmonds, Esq.	1836	2 0 4	2 10 9	3 5 11	4 10 9	6 15 5
Life Association of Scotland, 64, Old Broad Street.	Thomas Fraser, Esq.†	1839	1 17 0	2 8 7	3 5 1	4 13 3	6 18 1
Liverpool & London, 20, Poultry.	B. Henderson, Esq.†	1836	1 19 0	2 9 5	3 5 5	4 12 7	
London Assurance Corp. 7, Royal Exchange, & 10, Regent St.	Peter Hardy, Esq.	1720	2 0 2	2 10 8	3 5 1	4 10 7	6 12 5
London Life Association, 81, King William Street.	Edward Docker, Esq.	1806	2 9 3	2 19 3	3 17 0	5 7 6	7 15 0
London Mutual, 63, Moorgate St.	Henri C. Eiffe, Esq.	1848	1 17 3	2 7 11	3 3 6	4 9 7	7 3 0
London & Provincial, Nicholas Lane, Lombard Street.	Charles Ingall, Esq.	1846	1 15 8	2 6 10	3 3 4	4 9 8	7 7 6
London & Provincial Law, 32, Bridge St., Blackfriars.	John Knowles, Esq.	1845	2 1 0	2 10 7	3 5 9	4 10 6	6 16 4
Medical, Invalid & Gen., Pall Mall.	F. G. P. Neison, Esq.	1841	1 17 5	2 7 5	3 2 10	4 8 11	6 15 7
Medical, Legal & Gen., 126, Strand.	F. G. Bigg, Esq.†	1846	1 15 0	2 6 2	3 1 2	4 7 8	6 19 0
Mentor, 2, Old Broad Street.	Louis More, *Manager.*	1848	1 13 3	2 1 9	2 16 7	4 3 3	6 11 6
Merchants & Tradesmen's, 5, Chatham Place, Blackfriars.	T. Musgrave, Esq.†	1844	1 17 11	2 9 6	3 5 11	4 11 11	7 6 11
Metropolitan, 3, Prince's St., Bnk.	R. Heathfield, Esq., *Sup.*	1835	1 19 6	2 9 9	3 6 4	4 12 0	6 11 6
Metropolitan Counties, &c., 27, Regent St., Waterloo Pl.	W. S. B. Woolhouse, Esq.	1848	1 17 3	2 9 4	3 5 11	4 14 2	6 18 6
Minerva, 84, K. William St., City.	W. T. Robertson, Esq.	1836	2 1 0	2 10 7	3 5 0	4 8 0	6 7 2
Mitre, 23, Pall Mall.	S. P. Plumer, Esq.†	1846	1 11 7	2 0 9	2 15 8	4 1 11	
Monarch, 4, Adelaide Place, City.	J. T. Clement, Esq.	1835	1 18 10	2 5 8	3 1 3	4 9 6	6 17 9
Mutual, 39, King St., Cheapside.	Samuel Brown, Esq.	1834	1 19 11	2 10 2	3 7 6	4 12 7	7 2 0
Mutual Insurance, 51, Threadneedle Street.	Mr. James Bishop.†	1820	1 18 0	2 9 5	3 7 6	4 10 8	6 7
National Assurance, &c., 7, St. Martin's Pl., Trafalgar Sq.	William Whitfeld, Esq.	1844	1 18 0	2 9 5	3 7 5	4 18 7	7 14

ASSURANCE OFFICES.	ACTUARY, OR SECRETARY.†	When Founded	ANNUAL PREMIUM FOR ASSURING £100.				
			Age 20	Age 30	Age 40	Age 50	Age 60
National Friendly Society, 18, Red Lion Square.	W. G. Reynolds, Esq.†	1846	1 15 1	2 7 2	3 3 2	4 7 6	7 1
National Guardian, Moorgate St.	W. E. Hillman, Esq.	1850	1 15 10	2 6 10	3 2 4	4 6 11	6 18
National Life Society, 2, King William Street, City.	Mr. Charles B. Smith.	1830	2 0 8	2 10 4	3 5 9	4 12 8	6 19
National Loan Fund, 26, Cornh.*	W. S. B. Woolhouse, Esq.	1837	1 17 4 1 19 0	2 9 3 2 13 4	3 5 3 3 8 0	4 13 6 5 1 8	7 8 7 18
National Mercantile, Poultry.	Jenkin Jones, Esq.	1837	1 19 7	2 9 2	3 4 9	4 12 3	7 1
National Provident, 48, Gracechurch Street.	C. Ansell, F.R.S.	1835	1 19 4	2 10 2	3 6 3	4 11 1	6 11
New Equitable, 450, West Strand.	Sydney Crocker, Esq.	1850	1 17 9	2 8 2	3 5 10	4 12 9	7 5
North British, 4, New Bank Bdgs.	H. T. Thomson, Esq.†	1809	1 18 2	2 9 10	3 5 0	4 7 0	6 13
North of England, 11, Cheapside.	George Stewart, Esq.	1844	1 14 0	2 4 8	3 1 0	4 10 4	7 3
Northern, 1, Moorgate Street.	A. P. Fletcher, Esq.†	1836	1 18 10	2 5 8	2 19 5	4 7 1	6 12
Norwich Union, Crescent, New Bridge St., Blackfriars.	Richard Morgan, Esq.	1808	1 19 6	2 8 10	3 2 0	4 6 0	6 7
Palladium, 7, Waterloo Place.	Jeremiah Lodge, Esq.	1824	2 3 7	2 13 5	3 7 11	4 10 8	6 7
Pelican, Lombard St., and 57, Charing Cross.	Robert Tucker, Esq.	1797	1 19 3	2 10 4	3 6 5	4 10 7	6 7
Professional, 76, Cheapside.	Edward Baylis, Esq.	1847	1 16 8	2 5 7	3 1 3	4 9 5	
Promoter, 9, Chatham Pl., Blkfrs.	Michael Saward, Esq.†	1826	1 16 11	2 9 2	3 6 6	4 14 2	7 14
Provident, 50, Regent St., & 2, Royal Exchange Buildings.	J. A. Beaumont, *Man.D.*	1806	2 3 7	2 13 5	3 7 11	4 10 8	
Provident Clerks', 42, Moorgate St.	William Ratray, Esq.	1840	1 16 1	2 6 4	3 2 8	4 12 2	7 11
Prudential Mutual, 14, Chatham Place, Blackfriars.	David Jones, Esq.	1848	1 18 8	2 8 10	3 3 0	4 5 6	6 13
Reliance, 71, K. William St., City.	Osborne Smith, F.S.A.	1840	1 17 7	2 9 4	3 5 10	4 14 2	6 18
Rock, 14, New Bridge St., Blkfrs.	John Goddard, Esq.	1806	2 3 7	2 13 5	3 7 11	4 10 8	6 7
Royal, 29, Lombard Street.	Percy M. Dove, Esq.	1845	1 19 4	2 9 9	3 4 1	4 8 3	6 14
Royal Exchange, Royal Exchange, & 29, Pall Mall.	John A. Higham, Esq.	1720	2 3 6	2 13 3	3 8 0	4 10 9	6 7
Royal Farmers', 346, Strand.	W. Shaw, *Man. Direc.*	1839	1 16 10	2 7 5	3 3	4 10 7	6 18
Royal Naval, &c., 13, Waterloo Pl.	John Finlaison, F.S.A.	1837	2 3 2	2 12 3	3 7 8	4 14 6	7 0
Scottish Amicable, 43, Lombard St.	J. E. C. Koch, Esq.†	1826	2 1 6	2 11 1	3 5 6	4 8 3	6 5
Scottish Equitable, Moorgate St.	W. Cook, Esq., Agent.	1831	2 1 6	2 11 1	3 5 6	4 8 3	6 5
Scottish Provident, 12, Moorgate Street.	George Grant, Esq.†	1837	1 15 8	2 1 6	2 14 9	4 1 7	6 6
Scottish Widow's Fund, 4, Royal Exchange Buildings.	J. Mackenzie, *Manager.*	1815	2 1 6	2 11 1	3 5 6	4 8 4	6 5
Scottish Union, 37, Cornhill.	James Barlas, Esq.†	1824	1 18 5	2 9 11	3 5 0	4 7 9	
Solicitors' & General, 57, Chancery Lane.	F. G. P. Neison, Esq.	1846	1 19 0	2 9 5	3 5 6	4 12 7	7 1
Sovereign, 49, St. James's Street.	J. J. Sylvester, M.A.	1845	1 19 4	2 9 4	3 5 2	4 12 2	6 19
Standard, 82, K. William St., City.	Peter Ewart, Esq.†	1825	2 1 1	2 10 7	3 4 11	4 8 6	6 11
Star, 48, Moorgate Street.	W. E. Hillman, Esq.	1843	1 17 4	2 8 9	3 4 11	4 10 6	7 4
Sun, Threadneedle Street.	C. H. Lidderdale, Esq.	1810	1 16 11	2 9 2	3 6 6	4 14 2	7 14
Times, 32, Ludgate Hill.	H. B. Sheridan, *Manager.*	1849	1 15 11	2 5 5	3 0 2	4 8 11	6 15
Trafalgar, 454, West Strand.	Edward Baylis, Esq.	1850	1 16 4	2 5 3	3 0 11	4 8 1	6 18
Union, Cornhill, & Baker Street.	Thomas Lewis, Esq.†	1714	2 3 7	2 13 5	3 7 11	4 10 8	6 7
United Guarantee, 36, Old Jewry.	Edward Ryley, Esq.	1849	1 19 5	2 11 6	3 5 11	4 11 11	7 6
United Kingdom, 8, Waterloo Pl.	John King, Esq.	1834	1 18 8	2 8 2	3 3 4	4 10 7	6 17
United Kingdom Temperance, 39, Moorgate Street.	Theodore Compton, Esq.	1840	1 15 8	2 5 11	3 1 6	4 7 0	6 6
United Mutual, 54, Charing Cross.	W. S. B. Woolhouse, Esq.	1849	1 18 4	2 9 3	3 5 7	4 13 0	7 7
United Service and General, 20, Cockspur St., Charing Crss.	Charles Ingall, Esq.	1850	1 19 6	2 10 0	3 4 10	4 10 1	6 12
Universal, 1, K. William St., City.	David Jones, Esq.	1834	1 18 8	2 8 10	3 3 0	4 5 6	6 13
University, 24, Suffolk St., Pl. Ml.	C. M. Willich, Esq.	1825	2 1 5	2 10 9	3 4 7	4 7 6	6 7
Victoria, 18, K. William St., City.	William Ratray, Esq.	1838	1 16 11	2 9 2	3 6 6	4 11 10	6 19
West of England, 20, New Bridge St., Blackfriars.	James Anderton, *Man.*	1807	2 0 11	2 11 3	3 6 1	4 9 1	6 7
Western, 3, Parliament Street.	A. Scratchly, M.A.	1842	1 16 7	2 6 11	3 0 11	4 5 11	
Westminster, Adelaide St., Strnd.	John Helps, Esq.†	1792	2 3 7	2 13 4	3 7 11	4 10 10	6 7
Westminster and General, 27, King St., Covent Garden.	W. M. Browne, Esq.	1836	2 1 8	2 10 7	3 4 6	4 9 11	6 7
Yorkshire, Wellington St., Strnd.	W. L. Newman, Esq.	1824	1 14 4	2 5 0	2 19 9	4 4 9	

* On the higher rates of the *National Loan Fund* the Assured may at any time receive an immediat advance to the extent of one-half the amount of the paid annual premiums, on paying interest thereon without personal liability or deposit of the Policy, but simply by endorsement. Or one-half of every annua premium may be retained, at interest from the commencement of the Assurance for any length of time, or fo the whole period of life. And should the Assured at any time desire to give up his Policy, one-half of th aid annual premiums would be immediately returned on application.

ASYLUMS.

Asylums in and about London are also numerous. They are established for the maintenance and protection of deserving persons, in a degree of superior comfort to that of most other charitable establishments. They are also applicable for the lodging, sustaining, and the education of indigent children left as orphans, or otherwise.

There are no government institutions for bringing up the blind, or the deaf and dumb; and though there are children so afflicted in the union houses, yet the system of district schools for pauper children has not yet been sufficiently extended to admit of special establishments. The schools and asylums for these two classes throughout the country are the spontaneous result of private benevolence.

Although the School for the Indigent Blind in St. George's Fields was founded in 1799, yet Liverpool set the example to the metropolis. These schools are partly supported by the work of the inmates, and partly by chapel receipts. The school we have just named has 85 males and 89 females,—altogether, 174. The candidates must not be under 10 years of age, nor above 25; nor must they be able to distinguish light from darkness. The Committee prefer pupils between 12 and 18, as the education is partly industrial, several trades being taught, as basketmaking, cordworking, &c. The pupils are to be seen at work between 10 and 12, and 2 and 5, except Saturdays. They acquire some proficiency in music, so that three have been lately appointed church organists. The inmates are educated, boarded, clothed, and lodged, at a yearly charge of 8000*l.*, of which 2000*l.* is derived from investments, and 1300*l.* from the sale of work.

The London Society for Teaching the Blind to read have a new school for boarders in the Avenue Road, St. John's Wood, near the New Finchley Road. The terms are low, and for a charge of 7*l.* 10*s.* a child is in six months taught to read the raised character for the blind, suggested by Mr. Lucas. In this raised character a considerable part of the New and Old Testament has been printed by public subscription. Sometimes a blind man is to be heard in the thoroughfares reading one of the Gospels aloud, feeling the character with his fingers. The number of inmates of the school is 55,—27 males and 28 females. Of the funds 450*l.* are contributed by the pupils, 750*l.* by subscription. The school can be seen daily. The society have an evening school near Gray's Inn Lane.

The Indigent Blind Visiting Society supplies about 200 blind yearly with Testaments in the raised character, and with conductors to lead them to church. They are likewise visited by readers of the Scripture. On Sundays a group of blind is sometimes to be seen, led by a little boy or girl, on their way to church.

Hetherington's Charity give annuities of 10*l.* to above 600 aged blind of the better classes. Mr. Charles Day (the blacking manufacturer) left 100,000*l.*, from which annuities ranging from 12*l.* to 20*l.* are given to 271 blind persons. The Painters' Company distribute annuities of 10*l.* to 173 blind; the Clockmakers' and Cordwainers' Companies likewise relieve the blind. The Jews have an institution for giving 15*l.* a year to 12 blind.

The Asylum for Deaf and Dumb Children is in the Old Kent Road, and was founded in 1792, but the example was taken from Edinburgh. The children are taught to speak by signs, to read printed books, and to draw. 290 children are boarded, clothed, and lodged by the charity, besides about 20 boarders at 20*l.* yearly, and private pupils. The school can be seen every day, except Sunday, the best time being between 11 and 1 o'clock. The income is 10,000*l.* yearly.

There is an Institution for relieving the Adult Deaf and Dumb at 26, Red Lion Square, with a shop at 21, Theobald's Road, for the sale of articles made by the inmates. The trades taught are tailoring, shoemaking, dressmaking, &c., in which nearly 20 persons are instructed, besides 30 who are weekly assisted. There is a Charitable and Provident Society for the Deaf and Dumb, and the Cordwainers' Company have a small fund for their relief.

The Asylum for Idiots is in its infancy, having been instituted only in 1847, before which no attempt was made in England to teach idiots. The asylum is at Park House, Highgate, and the number of inmates about 60. The age is unlimited.

It will be observed that the union houses, and district schools in connection with them, provide for orphans of the poorer classes. In 1849 an Act of Parliament came into force, authorizing and enjoining the associations of unions for the establishment of district schools for union children, several of which are now in progress.

For the orphans of the better classes there are many schools established, in which they are boarded, lodged, and educated, such schools being supported by subscription (except Christ's and Foundling Hospitals), and the scholars being chosen by the votes of the subscribers or governors.

Asylum for the reception of Friendless and Deserted Orphan Girls, Bridge Road, Lambeth, instituted in 1758, incorporated 1800, for females only, the settlements of whose parents cannot be ascertained, or of deceased parents. No child is admitted under the age of 8 nor above 10 years of age. Upwards of 2500 children have been supported, lodged, and educated since its establishment.

Asylum and School for Female Orphans, Church Street, Paddington, instituted 1786, for bereaved and destitute orphans from 9 to 12 years of age.

Incorporated Clergy Orphan Society, St. John's Wood, Marylebone, founded 1749, incorporated 1809, for clothing, maintaining, and educating orphans of clergymen of the established English Church.

Bayswater Episcopal Chapel Female Orphan School, established 1839, for the maintenance and instruction of from 15 to 20 females.

Orphan Working School, Haverstock Hill, instituted 1758, incorporated 1848, for the reception of 20 female and male orphans.

Royal Military Asylum, Chelsea, instituted 1801, for orphan children of British soldiers, 350 of whom are supported, lodged, and educated (usually called the Duke of York's School). It is a most gratifying sight to see parade the boys of sufficient age to learn the military exercise, with their military band, in the morning.

The Foundling Hospital, Guildford Street, no longer answers to the name; because as there is now a full provision for orphan and deserted children, it would be mischievous to admit foundlings by means of a box or tour, and therefore it has become an asylum for poor illegitimate children whose mothers are known. This hospital is now richly endowed from the neighbouring houses belonging to it, and which have been built since 1739. The chapel, in which is an altar-piece by West, and which has a good choral service and good preachers, likewise adds to the funds, as the pew rents are high, and each visitor is expected to give 6*d.* or a larger coin. The income is about 10,000*l.*, and the number of children maintained 500, who are, while infants, sent out to nurse, and are afterwards kept until 15. In connection with the hospital is a society for the relief of foundlings, their widows and children. The kitchen of the Foundling, with Count Rumford's cooking apparatus, and the court-room, with pictures by Hogarth and others, are worth seeing.

The London Orphan Asylum, at Clapton, founded in 1813, for children from 7 to 14 years of age: there are about 400 boarded and educated. The average expense of each child is—Food, firing, and washing, 10*l.* 18*s.* 6*d.*; clothing, 3*l.* 10*s.* 5*d.*; salaries and wages, 3*l.* 2*s.* 2*d.*; building and repairs, 3*l.* 13*s.* 4*d.*; outfit and rewards on leaving, 1*l.* 9*s.* 10*d.*; altogether, 22*l.* 14*s.* 4*d.* The income is about 8000*l.* yearly.

The British Orphan Asylum, Clapham Rise, was founded in 1827. There are nearly 100 children.

The Adult Orphan Institution, St. Andrew's Place, Regent's Park, founded 1818, maintains about 80 orphan daughters of officers and clergymen, from the ages of 14 to 19. They are brought up as governesses, the instructions being of a superior description.

The Merchant Seamen's Orphan Asylum, New Grove, Bow Road, brings up 110 children. Some of the boys are sent to sea.

The Sailors' Orphan Girls' School, 29, Cannon Street Road, maintains 20 orphans, and educates and clothes 20 more. The Sailors' Female Orphan Home is another small institution.

The Royal Asylum of St. Ann's Society, Streatham, Surrey, was founded 1709. It maintains and educates 151 boys and 76 girls, who are orphans or the children of necessitous parents who have seen better days. The income is 6400*l.*

Raine's Charity, St. George's in the East, provides an Asylum for some of the girls brought up in the school, who are eligible to receive a marriage portion of 100*l.*

The Ladies' Charity School, 30, John Street, Bedford Row, founded 1702, maintains 51 poor girls.—The Hans' Town School of Industry, 103, Sloane Street, maintains 50 girls till the age of 16; but a partial payment is required from each of 1*l.* 5*s.* per quarter.—St. John's Servants' School, 22, New Ormond Street, maintains 113 girls, who are trained as servants for two or three years. Some are kept till they are 18. Each child is paid for by its friends or other benevolent persons, the charge being 12*l.* a year. The establishment is strongly supported.

The Yorkshire Society's School, Westminster Road, maintains 34 boys and 13 girls.—The Westmoreland Society, founded 1746, maintains 26 children.

The Welsh Charity School, Gray's Inn Road, founded 1715, maintains 200 children, born in London of Welsh parents.—The Royal Caledonian Asylum, Copenhagen Fields, founded 1808, provides in like manner for 72 boys and 47 girls, children of Scotchmen. They are clad in what is called the Highland garb, and have a band of music and some pipers, who occasionally attend charitable festivals.—The Benevolent Society of St. Patrick, Stamford Street, Blackfriars Road, does not maintain any children, but clothes and educates 300 boys and 200 girls, born of Irish parents.—The Jews maintain 55 boys and 20 girls in their hospital; and others in their orphan asylum, and in the School of the Gates of Hope.—The Westminster French Protestant Charity School, Bloomsbury, maintains girls, descendants of the refugees; and they have an hospital and alms-houses.—The Dutch have alms-houses.

The Royal Freemasons' School, for Girls, Obelisk, Westminster Road, maintains the daughters and orphans of decayed brethren.—The Royal Masonic Institution for boys, 7, Bloomsbury Place, maintains 70 of the other sex.

The Licensed Victuallers' School, Kennington Lane, Lambeth, maintains 117 children.—The Commercial Travellers' School, Wanstead, maintains 70 children.

The Marine Society, founded in 1772, is a peculiar institution. It has a ship, the *Venus*, lying off Woolwich, in which 100 boys are kept and trained for the sea service. In 1849, 40 were sent into the Indian navy, and 209 into the merchant service. The boys attend, with their flags, drums, and fifes, at the Lord Mayor's Show.

St. Margaret's Hospital, Tothill Fields, Westminster, or the Green-coat School, founded 1633, maintains 25 children of the parish.—The Blue-coat School, Tothill Fields, founded 1688, maintains children of St. Margaret's and St. John's.—The Grey-coat Hospital, Tothill Fields, founded 1698, maintains 67 boys and 33 girls of the same parishes.—The Burlington Charity School, Boyle Street, maintains 110 girls, of St. James's, Westminster, till the age of 15.

Infant Orphan Asylum, Wanstead, 1827, incorporated 1843, to board, clothe, nurse, and educate, on the principles of the Church of England, destitute children who are fatherless; and, if necessary, to receive them from their birth.

New Asylum for Infant Orphans, Stamford Hill, founded 1844, to receive the infant from its birth until 8 years of age.

Cholera Orphan Home, Ham, Richmond, established 1849, at the present time for females only who have lost both parents, and for boys when the funds will allow.

The Agricultural Orphan School is in the course of establishment.

Corporation of the Royal Caledonian Asylum, Chalk Road, Copenhagen Fields, for supporting and educating the children of soldiers, sailors, and marines, natives of Scotland and of indigent Scotch parents, resident in London, not entitled to parochial relief. Admitted between the ages of 7 and 10, and are retained until 14. Instituted 1813, incorporated 1815. President, the Duke of Buccleuch and Queensbury.

Aske's Hospital and Episcopal Chapel, affording board, clothing, and education for 20 boys, from the ages of 7 to 14.

Asylum for 20 men, who must be bachelors or widowers, and 16*s.* per week each, with an additional allowance in sickness. Founded by Robert Aske, 1690.

Hoxton Orphan Asylum and Ladies' Charity School, for educating, clothing, and maintaining 51 poor girls from all parts of the United Kingdom, whether orphans or not. Admitted between the ages of 8 and 10.

The trade asylums and alms-houses are of modern origin.—

The Licensed Victuallers' Asylum, Old Kent Road, was established 1827, and is one of the finest of the modern foundations. The asylum contains 126 dwellings and 143 inmates; and for this purpose 25,000*l.* was collected within six years. Each dwelling has three rooms.

The Bookbinders' Provident Asylum is at Balls Pond.

The Builders' Asylum is not yet erected.

The Metropolitan Benefit Societies' Asylum, Balls Pond, Islington, was built in 1836, for members of benefit societies, of whom there are 50 inmates.

The Asylum for Aged and Decayed Freemasons was opened in 1850, at Croydon. It is for 36 inmates.

The Aged Pilgrims' Asylum, Camberwell, is for 42 members of a religious society of the same name. The Christian Union Alms-houses, John Street, Edgware Road, is another dissenting foundation for 36 inmates.

The Jews' Hospital, Mile End, provides for aged Jews.—The Spanish and Portuguese Hospital, Mile End Road, likewise provides for aged Jews, besides sick.

There are many others which our space does not permit further to enumerate. The reader searching into the knowledge of these establishments, as well as charities generally of London, should procure a very painstaking and accurate work, entitled "The Charities of London," by Sampson Low, Jun. 1850.

BANK OF ENGLAND.

This, like most institutions of any stability or permanence, has grown from a very small beginning. The revolution of 1688 was followed by various schemes for the establishment of a national bank, chiefly to relieve the government from the very ruinous terms on which alone money could then be obtained; the expense very frequently 20 or 30 per cent., and never less than 8 per cent., even to be repaid from the first returns of the land-tax. The difficulty and trouble of obtaining very moderate loans, even on these terms, was also very great, the citizens having to be solicited from house to house. William Paterson, a Scotch gentleman, suggested, in 1691, the plan which was finally adopted; and in 1694 an Act was passed, enabling government to take subscriptions for 1,200,000*l.* towards carrying on the war with France; some new taxes being expected to yield 1,500,000*l.* The interest to be paid was 8 per cent., and 4000*l.* a year was allowed for management. This subscription was raised in ten days, and the subscribers were incorporated under the name of "the Governor and Company of the Bank of England," and enabled to purchase lands, and deal in gold and silver bullion, and bills of exchange. The first Charter incorporating this company was dated 27th of July, 1694; and its usefulness soon became so evident in various ways, that Bishop Burnet says, "all people saw into the secret reasons that made the enemies of the constitution set themselves with so much earnestness against it."

The original Charter was for fourteen years; and it has since been renewed seven times, for terms varying from 21 to 33 years. On the first renewal, in 1708, the Bank was protected against the competition of other large companies by prohibiting the formation of banking partnerships of more than six persons, a restriction which was removed, in 1826, for all places beyond 65 miles from London; and, in 1833, this exclusive right was surrendered entirely.

The most dangerous crisis in the history of the Bank were—first, about three years after its foundation; again, after the South Sea bubble; thirdly, in the rebellion of 1745, next in 1797, and, lastly, in 1825. But the only occasions when it virtually suspended payment were in 1697 and 1797. The first crisis was occasioned by a recoinage, in which the old coin was called in and replaced by notes, which, being payable on demand, were returned faster than the new coin could be got ready. Coin was therefore given for them only by instalments, at first fortnightly, and afterwards at intervals of three months; and the value of these notes sunk at one time to 20 per cent. discount. The difficulties commencing in 1797 were a far more serious affair, and sprung from a complication of circumstances, that drained off the precious metals from this country. The state of foreign exchanges, the commencement of war, and the necessity of importing corn at extravagant prices, all conspired to this effect. The alarm of invasion caused a desire to withdraw and hoard money, and the country banks were breaking on every side, when, on the 26th of February, the treasure in the Bank being reduced to 1,086,170*l.*; a council was held (the first, it is said, that George III. had even attended on a Sunday), and an order issued that the Bank should "forbear any cash in payment until the sense of Parliament can be taken on that subject," &c. This was the beginning of a reign of paper-money that lasted no less than 21 years. The first Bank Restriction Act, which was passed about two months after the above order, continued the prohibition for 52 days. Fifty days having expired, the term was extended to a month after the commencement of the next session, then till six months after the peace, which was that of Amiens. On the occurrence of this, however, the restriction was continued till March 1803, then till the conclusion of the war, and lastly, till July, 1818. Even then, in 1819, it was found necessary to renew partial restrictions, and the Bank did not finally resume its regular functions till May, 1823. During this long period of difficulty, various Acts were also passed to prohibit the taking of bank notes for less, or of gold for more, than their nominal value.

The business of Government loans first began to be transacted at the Bank instead of the Treasury in 1718, and is now entirely managed at this immense establishment, which received for that service at one time as much as 250,000*l.* a year, but the rate of this allowance has been gradually much diminished. In 1822–23 the interest on a portion of the National Debt, amounting to 215,000,000*l.*, was somewhat reduced, and the Bank paid off those who were dissatisfied. This is supposed to have led to the excessive speculation of every kind in the years 1824–5, which ended in the celebrated panic of the latter year. The Bank had then a narrow escape, its treasure being at one time reduced to less than it contained at the memorable suspension of cash payments in 1797. Government, however, would not sanction the repetition of any such step; and the storm being met with unparalleled boldness and spirit, at length it providentially blew over. Indeed it is curious to observe the different modes of treatment applied on the three last occasions of extreme pressure in 1745, 1797, and 1825. On the first occasion the Bank condescended, in order to gain time, to dole out its payments in silver, and even in sixpences. On the last this policy was reversed, and the gold paid away in bags of 25 sovereigns each. Bullion continually arrived, and the Mint was kept at work day and night.

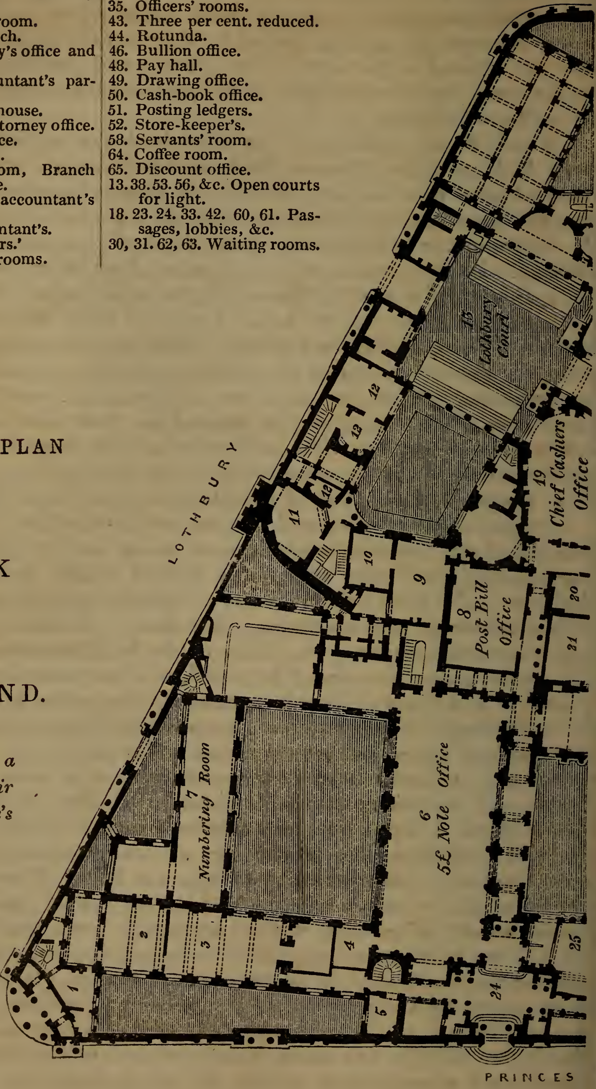
The Bank authorities consist of a governor, deputy-governor, and 24 directors, eight of whom are renewed every year, being nominally elected by the proprietors of 500*l.* or more, but the election is never contested. The governor must be a proprietor to the extent of 4000*l.*, the deputy-governor of 3000*l.*, and a director of 2000*l.*, but they are not generally chosen from among the largest holders of bank stock nor the richest men, and in 1837 the governor was actually a bankrupt. A full meeting of the directors is held weekly, a court of ten sit every Wednesday, and the governor and a select committee of three, who have passed the chair, meet daily. A general meeting of the company takes place four times a year.

The clerks, porters, engravers, printers, &c., employed in the Bank amount usually to about a thousand. Their salaries vary from 50*l.* at the age of 17, and increase yearly till they reach a maximum of 260*l.*; the average of the whole being about 225*l.* They are promoted according to seniority. There are also about 200 superannuated pensioners, receiving on an average less than 200*l.* a year each. The allowance to the directors is altogether about 8000*l.* a year. The accounts of the Bank, which, during the first year of its existence, were kept in one ordinary ledger, now fill 300 such volumes daily, so that the mere bookbinding carried on within its walls is no ordinary business. The notes, of which the circulation now commonly amounts to 18,000,000*l.* or 19,000,000*l.*, are no two alike, both in number and date, and the Bank never issues the same note twice, although the average period of their remaining in circulation does not exceed a few days. The printing and numbering, as well as the weighing of sovereigns, is all performed by most ingenious self-acting machinery.

Up to 1736 the business of the infant bank was carried on in the small building called Grocers' Hall, in the Poultry. It was then removed to a new building, erected by George Sampson, architect, near the church of St. Christopher, and on the site of what is now the centre of the Threadneedle Street front of the present immense building. To this nucleus two wings were added, between 1766 and 1786, from the design of Sir Robert Taylor, which enlarged that front to its present extent of 365 feet. Lastly, in 1788, Sir John Soane began to extend, modify, and rebuild, till the present structure, occupying not merely the site of St. Christopher's Church and Cemetery, but very nearly the whole parish, was complete, and may be said to be entirely of his design, except some of the faces of some internal courts which retain the work of Taylor, and the large office in the south-west angle, lately remodelled by the present bank architect, C. R. Cockerell, Esq., Prof. of Architecture in the Royal Academy.

The accompanying plans and references will show that the building consists of an irregular assemblage of rooms on the ground-floor, rarely having any upper storey, and lighted chiefly by lanterns or skylights. The parts built by Soane are mostly vaulted, to avoid risk of fire, and many have no timber about them. Beneath are cellars, said to exceed in capacity the whole of the buildings above ground. The entire group is enclosed by a wall, too low, compared with its extent, to make any striking appearance in the centre of a city, but decked throughout its circuit with a variety of sham porticoes, sham windows and doors, and empty niches. The amount of this decoration, and its entire superfluity, must impress an idea of magnificence and profusion; though it must be admitted that whatever objects of use *will* peep out are excessively mean. Still it is, perhaps, the most sumptuous piece of mere scenery ever erected, except that which has been found necessary to hide the British Museum. The details of this screen-enclosure, and of all Soane's parts within, consist chiefly of grooves, derived apparently from tattooing, with other forms of extreme singularity, invented by himself. On the exterior this singularity, however, is not fully seen, being diluted or overpowered by the presence of the ordinary apparatus of columns and entablature. It is curious that an artist affecting so much originality should, for this most important part of the design, have merely used a ready-made pattern, the whole order being an exact reproduction of that of the round temple at Tivoli (only omitting the frieze sculpture). We doubt whether the practice (wholly *peculiar*

1. Mould-makers.
2. Note office.
3. Accountants' drawing office.
4. Note store-room.
5. Nightly watch.
9, 10. Secretary's office and room.
11. Chief accountant's parlour.
12. Secretary's house.
15. Power of attorney office.
17. Interior office.
20. Silver office.
21. Private room, Branch banks office.
25. Deputy accountant's office.
26. Chief accountant's.
27. Chief cashiers.'
28. Governor's rooms.
29. Deputy governor's.
32. 36. Committee rooms.
34. Secretary's.
35. Officers' rooms.
43. Three per cent. reduced.
44. Rotunda.
46. Bullion office.
48. Pay hall.
49. Drawing office.
50. Cash-book office.
51. Posting ledgers.
52. Store-keeper's.
58. Servants' room.
64. Coffee room.
65. Discount office.
13.38.53.56, &c. Open courts for light.
18.23.24.33.42. 60, 61. Passages, lobbies, &c.
30, 31. 62, 63. Waiting rooms.


LOTHBURY
15
Lothbury Court
12
13
12
11
19 Chief Cashiers Office
10
9
8 Post Bill Office
20
21
7 Numbering Room
6 5£ Note Office
2
3
4
1
5
24
25
PRINCES

GROUND PLAN

OF THE

BANK

OF

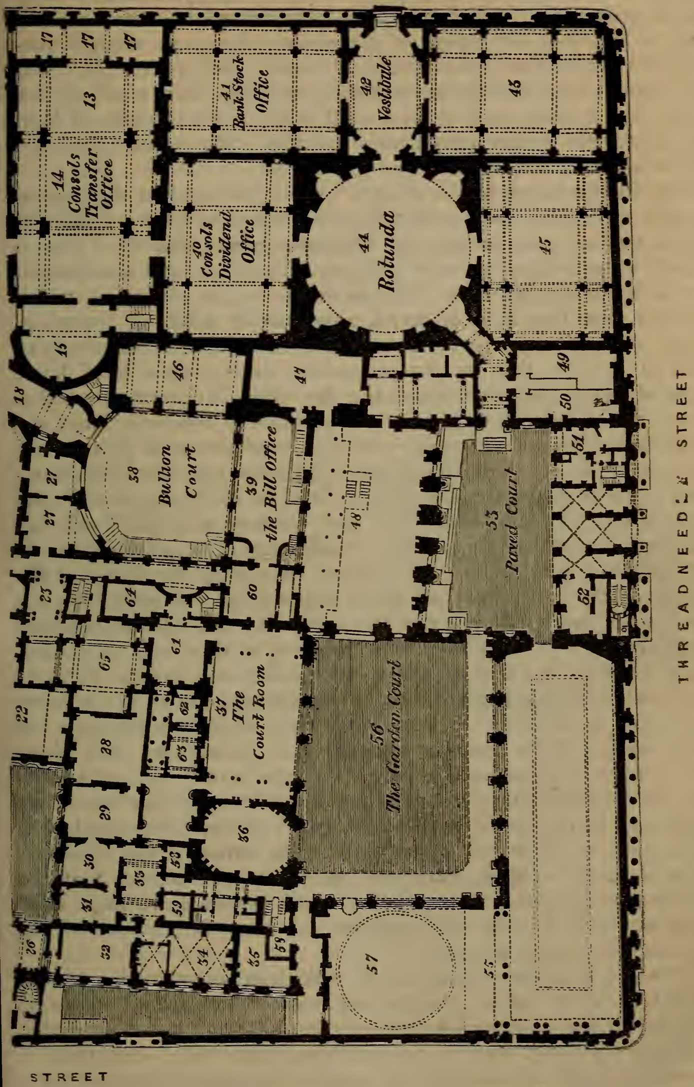
ENGLAND.

Copied from a Drawing in Sir John Soane's Museum.

BY

JOHN WEALE,

1851.


17
17
17
13
14 Consols Transfer Office
41 Bank Stock Office
42 Vestibule
43
40 Consols Dividend Office
44 Rotunda
45
15
46
47
18
49
50
38 Bullion Court
39 the Bill Office
48
51
53 Paved Court
27
27
23
64
60
52
61
65
22
37 The Court Room
62
63
28
56 The Garden Court
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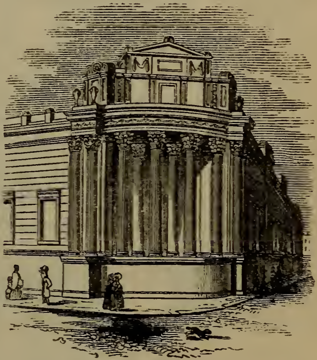
57
55
THREADNEEDLE STREET
STREET

to this age, and, we believe, to England, or, at least, to the Anglo-Saxon race) of thus taking a ready-designed order, just as we find it, will ever succeed. All these things were designed *for their places;* and, in this case, the fitness of the whole order to its original purpose is most admirable and deeply studied. Everything (including the bossy frieze, plainly an essential part) has been contrived for distant rather than near view, a small scale, and an edifice of light and airy form—rather a toy than a building. We certainly can see no fitness in its new application.

The change which half-a-century, or less, produced in the general opinion of the architecture of Soane is perhaps without a parallel in the history of taste, fashion, or fickleness in any country. That it should at one time be only admired, at another only condemned, would be nothing strange. The mere fluctuation of fashion, which esteems now one kind of merit, now another kind, all important, would naturally lead us to expect this. But it is the peculiarity of English fashion, that its favourites are, during their brief hour, extolled either for every excellence for which language can find a name, or *specially* for those identical qualities in which the next age finds them *specially* deficient. Perhaps no observer at present will be brought to believe, without some difficulty, that the Bank, however much admired, could ever have been so on the score of "*classical purity*," "*severe chasteness*," and "beauty of *detail;*" still less on that of "*grace*," "*majesty*," "*grandeur* of manner," "air of *sublimity*," "solemn *repose*," "*simple* grandeur," or, lastly, "the *poetry* of the art." Yet all these expressions we quote from a description written during the architect's life, in a work of standard authority, and perhaps the fullest account of this building extant. This document is a true specimen of its time; and, though not thirty years old, will soon become, if it be not already, one of the greatest curiosities in criticism. The research with which our language has been ransacked for terms of applause, and the industry with which the changes on them have been rung, render it such a complete pattern of adulation, that we doubt if any of the epistles dedicatory addressed to monarchs in the seventeenth century can equal it in extravagance. The misfortune is, that the writer, in his eagerness to exhaust the subject, attributed sometimes excellencies that are plainly incompatible; but still the whole would serve as a store from which to extract and recombine as many descriptions of this kind as can ever be wanted.

The step from the sublime to the ridiculous seems in this case to have been short indeed; for, twenty years later, we find almost the only writer that condescends to comment on this artist and his works, declaring, without fear of contradiction, that "Sir John was, in general, a sound constructor, but none of his works show one spark of superior science;" "he could not, for the soul of him, fall into grandeur of style; he could not leave a surface of six inches without tattooing it over;" "all his works are a collection of littleness; many of them are picturesque, but still littleness is the character of them." The fact seems to be, that, in the present state of their art, architects labour under the same disadvantage as kings, viz. entire exemption from any adverse judgment of their works while living. All other classes of men have a chance of self-improvement and progress; but with these, whatever defects they begin with, great or small, must "grow with their growth, and strengthen with their strenth," for in their case a common adage is reversed, and is read *de viventibus*, instead of "*de mortuis*," &c. The impossibility of any progress, individual or general, under such a system, is evident. As long as it lasts, the public must be content to be perpetually making afresh the discovery, that all which it paid for and idolized twenty years before was trumpery, and all of which it then boasted a disgrace.

By far the finest (if not the only graceful) thing in the exterior of this building, is the mock-entrance at the north-west angle. It well conceals the obliquity of the two sides; and, at a distance sufficient to prevent the obtrusion of the Soanean details, is certainly harmonious, and might pass for the work of a master. Chance plays curious freaks of this kind occasionally, as portraits in pebbles, &c. Yet, perhaps, the various features used in this vast building, if shaken into as many combinations as they here are, could hardly fail to produce one as fortunate.



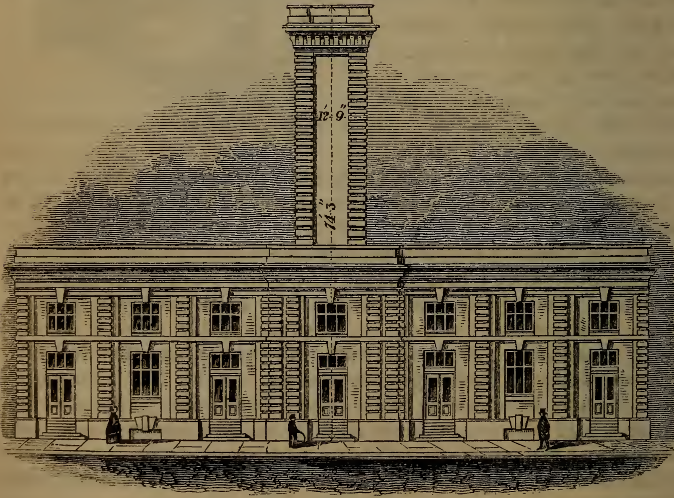
ANGLE OF THE BANK OF ENGLAND.

As respects the ground plan given in pages 250 and 251, it is that of the period of Sir John Soane, when architect to the Bank of England. It was too interesting a feature to be omitted in this work, although the drawing of it is publicly exhibited in the Soane Museum. The present architect to the Bank has made many very important alterations, not only in the exterior, but more particularly in its interior arrangements; yet, as an example of the interior of this building in a former age, it sets forth by contrast, the superior skill, in all probability, of existing arrangements. Much has been said of the skill of the plan-drawing of Sir Robert Taylor and Sir John Soane: architects, and others conversant with the present arrangements, may now judge of the merits of either, or both; and as the Introduction to this work is addressed to those capable of appreciating such matters, the plan is here presented for their judgment.

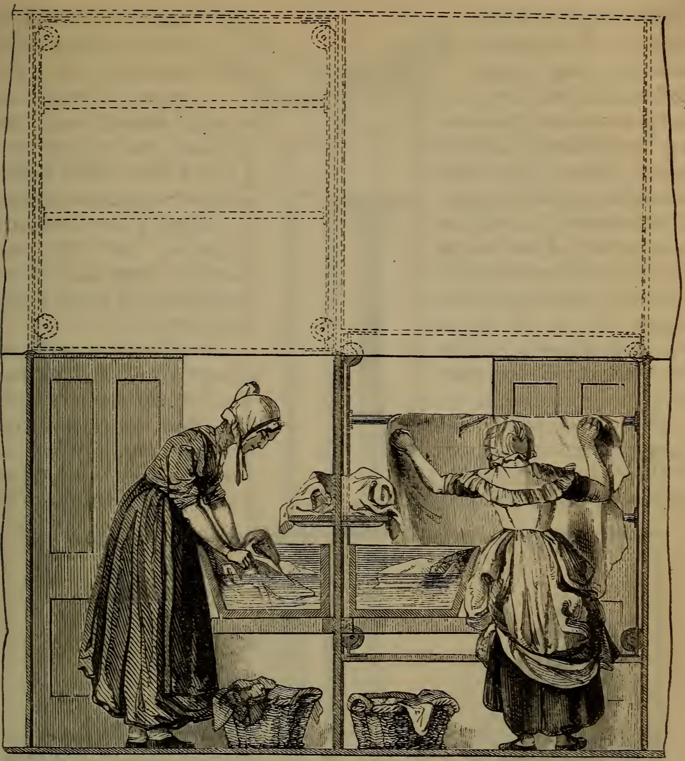
BATHS AND WASHHOUSES FOR THE INDUSTRIOUS CLASSES.

These institutions, which are now rapidly increasing in London as well as in the country, originated in a public meeting, held at the Mansion House in 1844, when a large subscription was raised to build an establishment to serve as a model for others, which it was anticipated would be erected, when it had been proved that the receipts, at the very low rate of charge contemplated, would be sufficient to cover the expenses, and gradually to repay the capital invested. The Committee then appointed partially completed the Model Establishment in Goulston Square, in 1847, and opened 40 baths to the public, the demand for which by the working-classes has established beyond doubt the soundness of the principles which actuated the Committee; and such was the attention attracted to the subject by its proceedings, that the government, at the suggestion and instigation of Sir H. Dukinfield, Bart., induced Parliament to pass an Act to enable boroughs and parishes to raise money on the security of their rates, for the purpose of building baths and washhouses in all parts of the country.

The provisions of this act have already been adopted by seven parishes in London. St. Martin-in-the-Fields (constructed by Mr. Baly), of which Sir H. Dukinfield was then the rector; St. Mary-le-bone (constructed by Mr. Eales); St. John and St. Margaret's, Westminster (constructed also by Mr. Baly); St. James's, Westminster; Poplar; Greenwich; St. George's and St. Giles's, Bloomsbury, as well as in several boroughs in the country. The general arrangements of these establishments are based upon those of the model.



No. 1.



No. 2.

The success of the bathing department, as well as the necessity which existed for such means of cleanliness among the industrious classes, is to be found in the numbers who have used them since their first opening. At the Model, the St. Martin, and the George-Street establishments, 1,300,000 baths have been given in little more than 3 years, of which above 550,000 have been given in the year 1850.

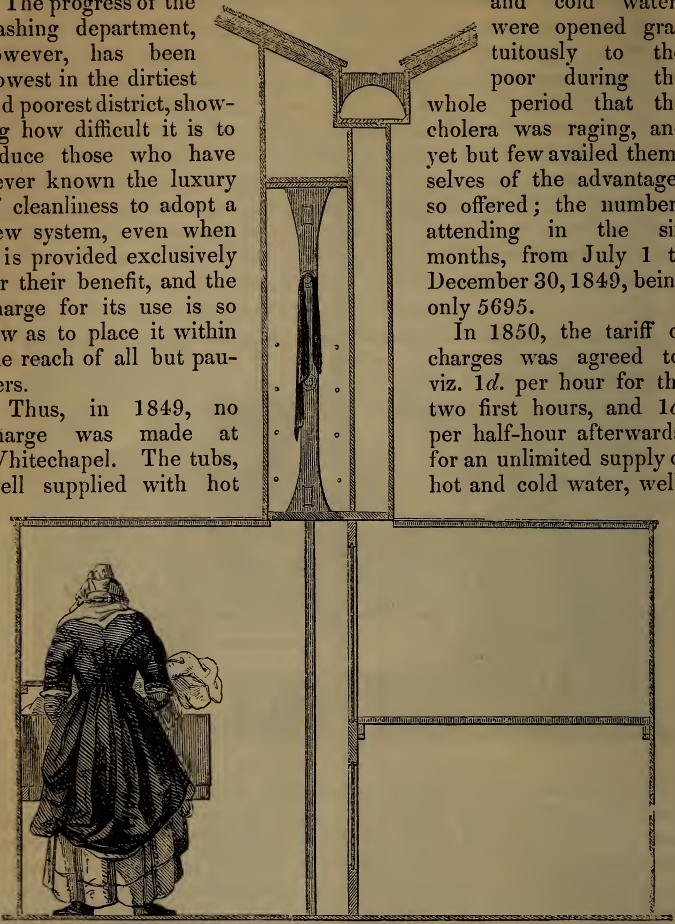
The laundry at the Model Establishment, the completion of which has been delayed from the want of funds, was not even in partial operation till after the erection of the parochial establishment in St. Martin-in-the-Fields, and that erected by private subscription in George Street, St. Pancras.

The anxiety of poor women to use the laundry has proved to be fully equal to that of the men to use the baths; for in the short period which has elapsed since the opening of the three laundries referred to the clothes of nearly 1,500,000 persons have been washed, dried, and ironed.

The progress of the washing department, however, has been slowest in the dirtiest and poorest district, showing how difficult it is to induce those who have never known the luxury of cleanliness to adopt a new system, even when it is provided exclusively for their benefit, and the charge for its use is so low as to place it within the reach of all but paupers.

Thus, in 1849, no charge was made at Whitechapel. The tubs, well supplied with hot and cold water, were opened gratuitously to the poor during the whole period that the cholera was raging, and yet but few availed themselves of the advantages so offered; the numbers attending in the six months, from July 1 to December 30, 1849, being only 5695.

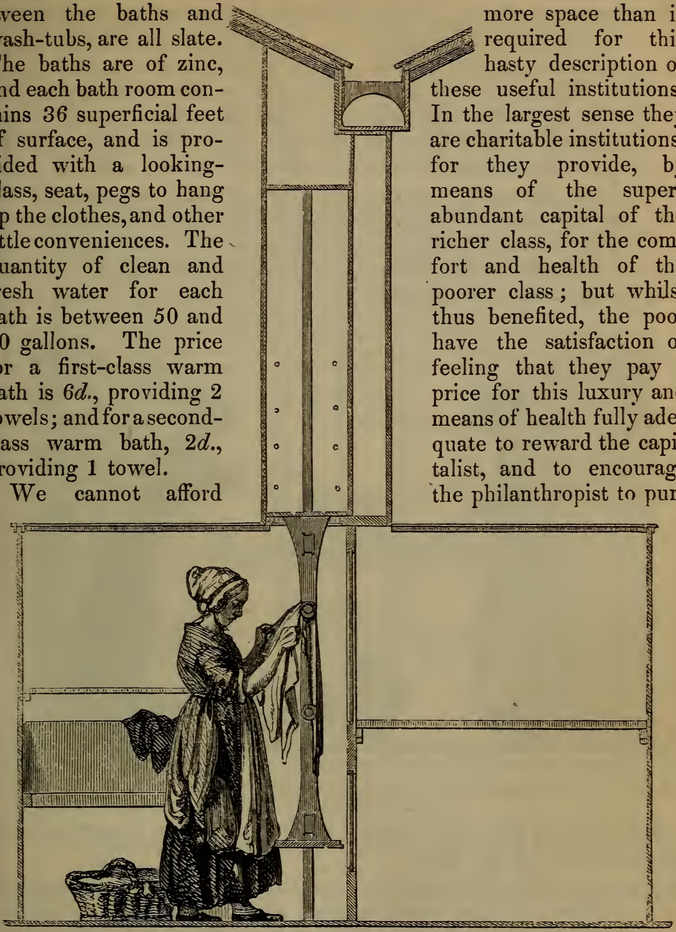
In 1850, the tariff of charges was agreed to, viz. 1*d.* per hour for the two first hours, and 1*d.* per half-hour afterwards, for an unlimited supply of hot and cold water, well-arranged drying closets, and irons and ironing boards. In the first six months but 4350 women attended, while in the second six months the number increased to 10,352; and this increase has been, and continues to be, progressive week by week; a progress so steady, and accompanied by such thankfulness on the part of the washers, that the committee feel satisfied they will soon be called upon to complete the remaining half of the wash-house, which is still unfinished for want of the necessary funds—about 1500*l.*



No. 3.

The floors of the bath rooms and washing rooms, the divisions between the baths and wash-tubs, are all slate. The baths are of zinc, and each bath room contains 36 superficial feet of surface, and is provided with a looking-glass, seat, pegs to hang up the clothes, and other little conveniences. The quantity of clean and fresh water for each bath is between 50 and 60 gallons. The price for a first-class warm bath is 6*d*., providing 2 towels; and for a second-class warm bath, 2*d*., providing 1 towel.

We cannot afford more space than is required for this hasty description of these useful institutions. In the largest sense they are charitable institutions, for they provide, by means of the superabundant capital of the richer class, for the comfort and health of the poorer class; but whilst thus benefited, the poor have the satisfaction of feeling that they pay a price for this luxury and means of health fully adequate to reward the capitalist, and to encourage the philanthropist to pursue his search for opportunities to benefit the poor without sacrificing their independence, or lessening their inducements to continue with cheerfulness their daily toil.

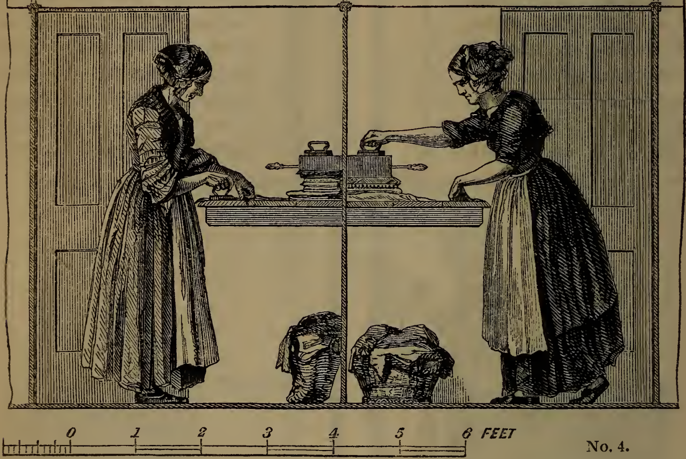


No. 3*.

We have now only to add, that foreign countries are following with alacrity and zeal the example we have set them. France, through the recommendations of a commission appointed by her President, has already voted 24,000*l.* to aid in the erection of Public Baths and Laundries in Paris.

Belgium and the United States are also alive to the importance of the subject, and, as well as France, are in correspondence with the Committee and Mr. Baly for plans which thus far have been stamped with the approbation of England, France, and America.

The Model Establishment is open at all times to visitors; and by application at the committee room the assistant secretary will make arrangements to attend, and to afford every information in his power to foreigners who may wish to examine the apparatus in detail.



No. 4.

We will now proceed to explain the drawings with which we have been favoured by Mr. Baly.

No 1. is the elevation of the Westminster Parochial Establishment, the most recently erected. Its style is plain and bold; simple, but conveying the idea of a public building erected with a view to durability and utility. It contains 64 Baths and 60 Wash-tubs, and 2 Plunge Baths; and, including the purchase of the site, will cost 13,000*l.*

No. 2 is a view of a woman at a wash-tub; and of a woman, having washed her clothes, hanging them up to dry.

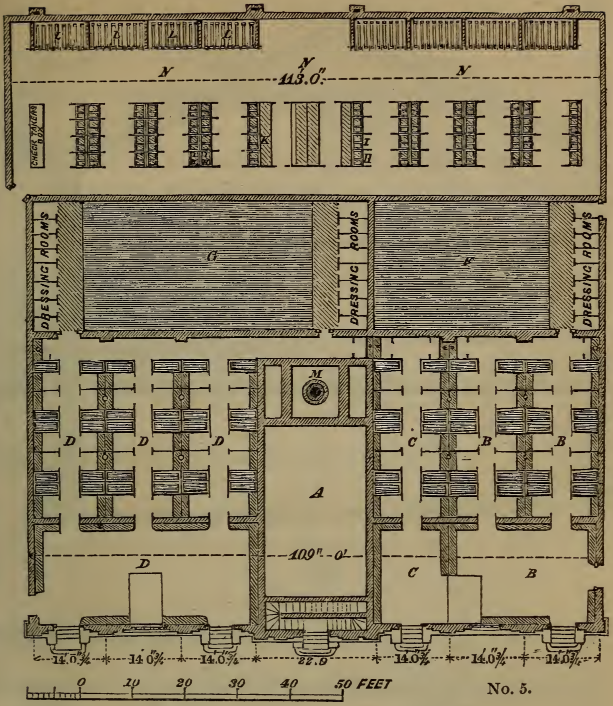
No. 3 and No. 3 *, showing the linen in the drying chamber, heated by hot-water pipes, immediately above the wash-tub, as well as a woman hanging up for drying previous to sending them to the drying chamber, as at St. Martin's.

No. 4. Section through the ironing chambers.

No. 5 is the general ground plan of the Westminster establishment:—

A. The boiler room, where the water is heated for the baths and wash-tubs.

M. The chimney and the ventilating flues, which carry off the vapour and foul air from the bath rooms.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N
113.0"
CHECK TAKERS BOX
K
I
H
G
F
DRESSING ROOMS
DRESSING ROOMS
DRESSING ROOMS
M
D
D
D
C
B
B
A
109"-0'
D
C
B
14.0½
14.0½
14.0½
22.9
14.0½
14.0½
14.0½
0
10
20
30
40
50 FEET

No. 5.

B and C. The second-class men and women's waiting rooms and baths.

D. The first-class men's baths and waiting room. The first-class women's baths are in an adjoining house, and not shown on this plan.

F. The first-class plunge bath and dressing rooms.

G. The second-class plunge bath and dressing rooms. The baths will contain respectively 20,000 and 40,000 gals. of water, will be 3½ ft. deep at one end, gradually increasing to the depth of 5 ft. at the other.

H and I are the washing tub and boiling tub, for the women washing, and are supplied with cold and hot water, and steam.

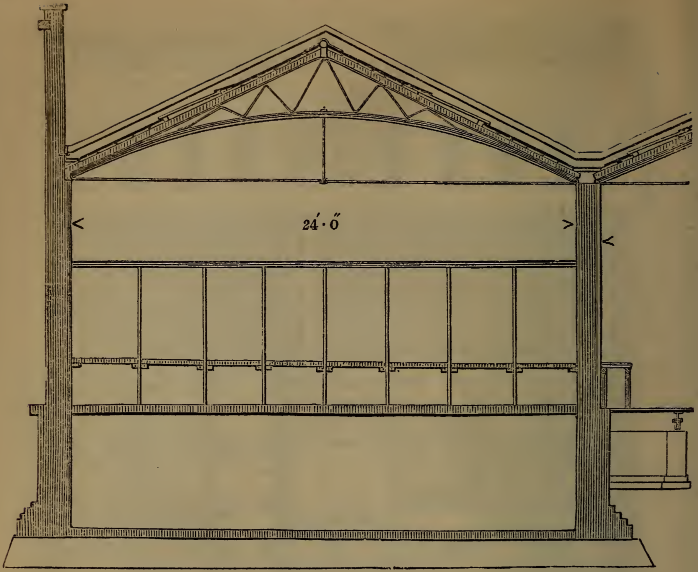
K. The ironing boards.

L. The drying chamber, heated by flues; the temperature of which, when in full work, will be maintained at above 200°.

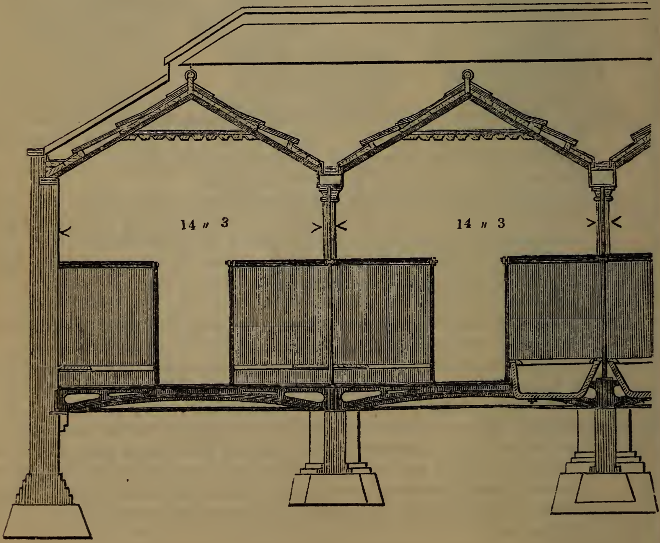
N. The situation of the wringing machines, by the use of which the wet linen is deprived, by a small expenditure of time and labour, of above half its water before being put into the drying chamber.

No. 6 and No. 6*. The section of the building through the washing department, the letters on which correspond with those on the ground plan, and therefore require no further notice; but we may call attention to the very ingenious construction of the wrought-iron roof, covered with glass and slate. Its lightness and simplicity, the elements of cheapness, fit it especially for a building of this kind.

No. 7 and No. 7*. Section through the bath room.

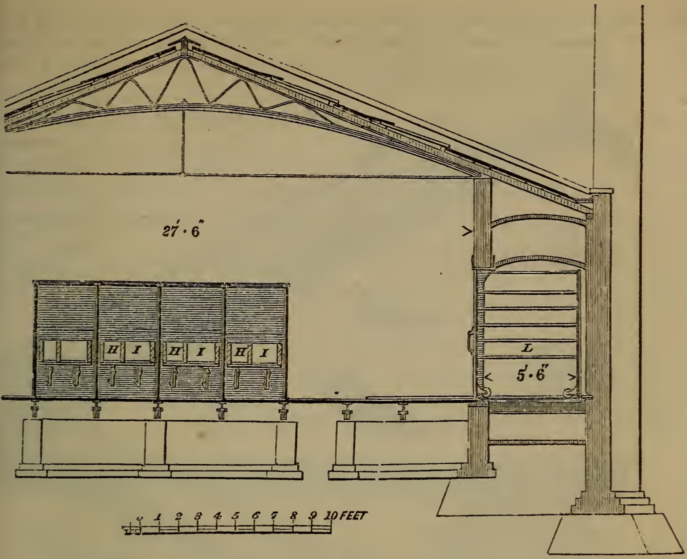


No. 6.



No. 7

[Scale—10 ft.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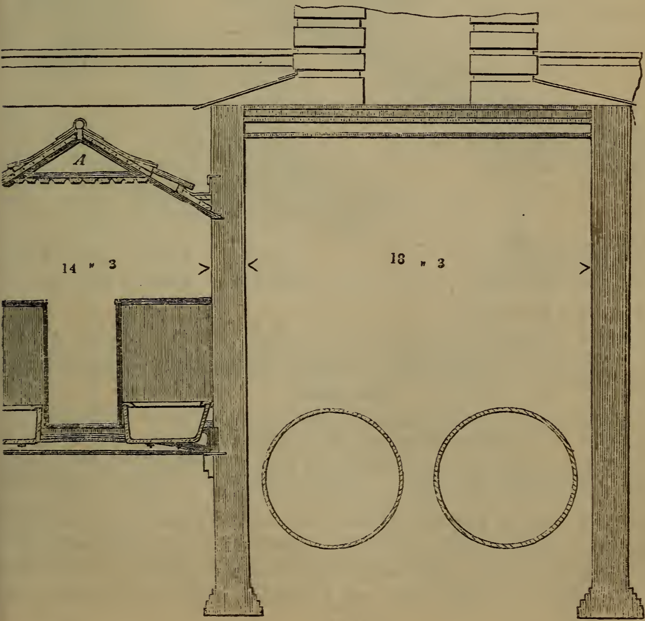
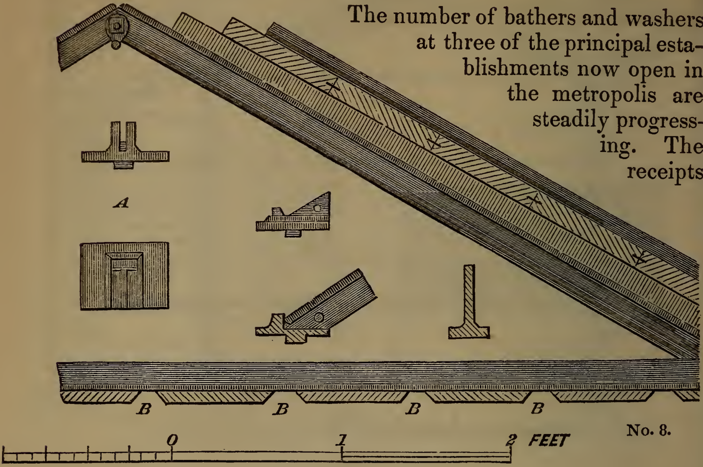


to an inch.]

No. 7*.

No. 8 and No. 8*. The details of the roof over the bath department, showing how these chambers are connected with the ventilating shaft; a large flue A being formed in the apex of the roof, into which the foul air and vapour are drawn, through the interstices of the ceiling boards B.



No. 8.

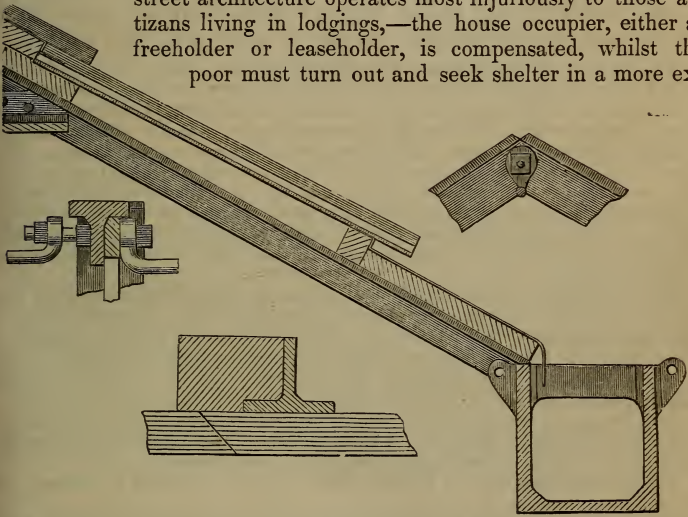
The number of bathers and washers at three of the principal establishments now open in the metropolis are steadily progressing. The receipts of this year have been as follows:—

ESTABLISHMENT.	Total number of bathers.	Total number of washers.	Total receipts.		
			£	s.	d.
The Model, Whitechapel, for 1850 . . .	137,519	14,702	2059	11	3
St. Martin-in-the-Fields . „ . . .	212,602	40,427	3722	9	5
St. Mary-le-bone . . . „ . . .	159,079	5,025	2051	12	0
Totals	509,200	60,154	7833	12	8
For 1849 they were—					
The Model, Whitechapel	108,082	5,695	1404	19	10
St. Martin-in-the-Fields	189,749	3,375	2877	19	1
And for 1848 they were—					
The Model, Whitechapel	48,637		580	9	4

Committee Room, 5, Exeter Hall; and Model Establishment, Goulston Square, Whitechapel.

Chairman of the Committee.—The Rev. Sir H. R. Dukinfield, Bart.
Deputy Chairman.—William Hawes, Esq.
Honorary Secretaries.—James Farish, Esq., and John Bullar, Esq.
Engineer.—P. P. Baly, Esq., C.E. *Assistant Secretary.*—George Woolcott, Esq.

To those born in a sphere of life far removed from want, and living in ignorance of the miseries of the masses of human life located in many districts of this vast metropolis, more especially in the most eastern parts of it, where Jew and Christian, infidel and sceptic, live, or rather exist, in houses badly constructed, ill ventilated and drained, and huddled together in filth—men, women, and children in the one room, and in many cases sleeping in one bed;—it will scarcely be credited by those living in comfortable and cleanly houses that such vice, misery, and discontent daily and nightly occur at so short a distance from the palaces and houses of the rich. Can it be wondered that the epidemic of the year 1848 should have prevailed so fatally, and that its anticipated return is so alarming to us all? Yet these direful calamities still remain among our poorer countrymen, and the moral degradation of this numerous class furnishes inmates for the prison and union workhouse. The value of labour in the production of several articles of daily use is reduced by the monopoly of the more wealthy trader, and the tendency of the improvement of street architecture operates most injuriously to those artizans living in lodgings,—the house occupier, either as freeholder or leaseholder, is compensated, whilst the poor must turn out and seek shelter in a more expensive lodging, and in a more densly-thronged neighbourhood, with no provision for him whose voice is too feeble to be heard. The benevolent establishments of baths and washhouses and model lodgings are, however, a great step in advance towards amelioration. It is Christian, and it is politic in a worldly sense; it is a beginning towards the salvation of soul and body, by cleansing the body and purifying the mind; it is an earnest in part payment of a debt due to those who labour for us. There is another and a most essential help yet required—the visitation by district committees of all houses wherein the casual nightly lodger is sheltered, the separation of the



No. 8*.

sexes, and the separation of children from the contamination of the thoughtless and the depraved. These good things are yet to be done, and it is the duty of the government, as well as of individuals, to aid in forming and carrying out measures to assuage these crying evils.

BAZAARS AND SHOW ROOMS.

London is not so largely supplied as might be supposed with institutions in the nature of Bazaars; the trade is too widely spread in the leading thoroughfares, which are here devoted to trade. What are here called Bazaars and Arcades, have shops for the sale of articles of female and fashionable demand. The shops of the Old Exchange, of the New Exchange, and of Exeter 'Change, were the predecessors of the present establishments, not one of which is of very old date.

The Pantheon, in Oxford Street, was originally built for a theatre or concert-room. It now presents a large hall fitted up with stalls for millinery, jewellery, knicknackery, toys, and music, with an upper gallery similarly fitted, and affording a view of the lower area. The attendants of the stalls are young women, and the visitants chiefly women and children. Towards Oxford Street are galleries of pictures for sale. The most remarkable work is a great painting by Haydon, of the Raising of Lazarus. On the ground floor on the Marlborough Street side, by which there is another entrance, is a pretty conservatory, in the oriental style, partly occupied for the sale of florists' flowers and exotic plants, and partly for the sale of parrots, love birds, singing birds, monkeys, loris, white mice, squirrels, and gold fish. This is one of the prettiest parts of the scene.

The Soho Bazaar, in Soho Square, does not present architectural features, but has fashion in its favour, and its stalls are a favourite female resort. There are no less than 400 saleswomen. The rent of a counter, 4 ft. long, is only a few shillings daily.

The Bazaar in Baker Street, is best known by Madame Tussaud's Exhibition, and a carriage repository. At Christmas, the Smithfield Club show of fat cattle and agricultural implements is held there. There is a show of ironmongery, stoves, &c.

The Burlington Arcade, in Piccadilly, is laid out in shops, and is occupied by tradesmen, principally foreigners, of some standing. Here are shops for foreign shoes, flowers, millinery, books and prints, and for hair-dressing.

The Western Exchange, 10, Old Bond Street, may be considered an accessory of the Burlington Arcade.

The Lowther Arcade, in the Strand, has less pretensions, but is thronged with children and their attendants, buying toys at the French, German, and Swiss shops.

The Lowther Bazaar, opposite to it, in the Strand, has stalls for the sale of toys, and there are many objects of interest for the amusement of visitors.

The Exeter Arcade, in Wellington Street, Strand, is only lately opened, and has as yet neither trade nor visitors.

The Opera Colonnade runs round the four sides of the Queen's Theatre, in the Haymarket, and is occupied with shops, but is little frequented. In the range, entirely covered in, and parallel with the Haymarket, are several hairdressers' and other shops, where opera glasses and books of the opera can be hired, and great coats, bonnets, &c., left during the opera performances.

The Piazzas, Covent Garden, formerly a fashionable lounge, have now no peculiar trade feature.

The Hungerford Arcade is a short range of inconsiderable shops attached to Hungerford Market.

The Pantechnicon, in Pimlico, is a bazaar for the sale of carriages, pianos, furniture, &c. Furniture and other goods can be warehoused.

The New Bazaar, about opening in New Oxford Street, promises to be upon a splendid scale; also a new one is now near completion for the use of the good people of Islington, in the Islington Road.

BUILDINGS (MODEL) FOR THE IMPROVEMENT OF THE CONDITION OF THE LABOURING CLASSES.

It is a pleasing sign of the present times, that the condition of the labouring classes is attracting unwonted attention, and that the interest excited is of a thoroughly practical kind. The example has been set by the Sovereign, and it has been followed by the most influential and revered names in the kingdom; so that, within the last few years, united and effectual exertions have been made to better the condition of working men and women, in town and country, by the improvement of their dwellings, and by the extension of the allotment system, wherever practicable. Of these praiseworthy efforts, the former is that which here demands our notice, so far, at least, as it relates to the metropolitan dwellings of the labouring classes.

That there is great and urgent need for the exertions of the benevolent is abundantly proved by the facts recently brought to light. The filthy and crowded state of the common lodging-houses, and other dwellings in those parts of London where the great masses of the people congregate, is a disgrace to a Christian country, and a constant source of physical and moral evil. Those, who in the course of their philanthropic exertions have explored the ordinary lodging-houses, both in the metropolis and the provincial towns, describe the majority of them as the very hotbeds of vice and crime, a disgrace to humanity, a reproach to the Christianity of England; and yet it is in such sinks of iniquity and contamination that the young artizan too often takes up his abode on first arriving in London, or when quitting the paternal roof, and there has every good principle undermined by evil associates, until he becomes a pest to society, and either sinks through disease and want into an untimely grave, or forfeits his freedom to the laws of his country. In fact, to use the words of the noble lord now at the head of the government, "As civilization progresses, we have not only the advantages but the evils of civilization, and unless we exert ourselves to counteract these evils among the people—and the greatest of these evils is over-crowding in insufficient dwellings—unless we exert ourselves from time to time to counteract such evils, our boasted civilization, instead of promoting religion, morality, and obedience to the laws, will tend to leave a great class of the population of this country without sufficient means for the comforts which they ought to have—without sufficient means of education—and, above all, without sufficient means for religious instruction and improvement."

Such considerations as the above gave rise, in 1844, to the foundation of the "Society for Improving the Condition of the Labouring Classes," under the patronage of the Queen, Prince Albert, the late Queen Dowager, and a large body of the nobility and clergy. This society endeavours to advance its objects by the following means:—

1st. By arranging and executing plans, as models, for the improvement of the dwellings of the poor, both in the metropolis and in the manufacturing and agricultural districts; by establishing the Field garden and cottage allotment system, and also friendly or benefit and loan societies, upon sound principles, and reporting the results, with a view to rendering them available as models for more extended adoption.

2ndly. By the formation of county, parochial, and district associations, acting upon uniform plans and rules.

3rdly. By correspondence with clergymen, magistrates, landed proprietors, and others disposed to render assistance in their respective localities, either individually or as members of local associations.

That this society has already done good service in the metropolis, is proved by the fact of its having erected three new model lodging-houses, and renovated and adapted three others, during the six years of its existence. These are:—1. George Street, Bloomsbury, for 104 single men. 2. Streatham Street, Bloomsbury, for 48 families. 3. Model Buildings, Bagnigge Wells, for 23 families, and 30 aged women. 4. No. 76, Hatton Garden, for 57 single women. 5. At 2, Charles Street, Drury Lane, for 82 single men, with a small lodging-house also for men, in King Street, Drury Lane. Besides these undertakings, it has also commenced an important and substantial building in Portpool Lane, Gray's Inn Lane, to be called, Thanksgiving Buildings, being intended as a lasting memorial of the deliverance of our country from the ravages of cholera, and mainly raised by the offerings of the people of the metropolis on the occasion of the General

Thanksgiving in 1849; offerings which were thus appropriated at the suggestion of the Bishop of London. In all these buildings the arrangements are of the most admirable kind; we give those of the George-Street "Lodging House for Working Men," as an example.

The kitchen and washhouse are furnished with every requisite and appropriate convenience; the bath is supplied with hot and cold water; the pantry-hatch provides a secure and separate well-ventilated safe for the food of each inmate. In the pay-office, under care of the superintendent, is a small, well-selected library, for the use of the lodgers. The coffee, or common-room, 38 feet long, 22 feet wide, and 10 feet 9 inches high, is paved with white tiles laid on brick arches, and on each side are two rows of elm tables, with seats; at the fireplace is a constant supply of hot water, and above it are the rules of the establishment. The staircase, which occupies the centre of the building, is of stone. The dormitories, eight in number, 10 feet high, are subdivided with movable wood partitions, 6 feet nine inches high; each compartment, enclosed by its own door, is fitted up with a bed, chair, and clothes box. In addition to the ventilation, secured by means of a thorough draught, a shaft is carried up at the end of every room, the ventilation through it being assisted by the introduction of gas, which lights the apartment. A ventilating shaft is also carried up the staircase for the supply of fresh air to the dormitories, with a provision for warming it if required. The washing closets on each floor are fitted up with slate, having japanned iron basins, and water laid on.

The contrast from their former wretched abodes to these most comfortable dwellings is so great, that workmen flock to the model lodging-houses in greater numbers than can be accommodated. The rent is neither more nor less than they have been accustomed to pay, for it is an object with the society not to excite enmity, by appearing as rivals of other landlords. In their model lodgings for families the society has endeavoured to preserve domestic privacy and independence to the inmates, and also to prevent the communication of infectious diseases, by disconnecting the apartments. This is done in the Streatham-Street houses by dispensing altogether with separate staircases, and other internal communications between the different stories, and by adopting one common open staircase leading into galleries or corridors, open on one side to a spacious quadrangle, and on the other side having the outer doors of the several tenements, the rooms of which are protected from draught by a small entrance lobby. The galleries are supported next the quadrangle by a series of arcades, each embracing two stories in height, and the slate floors of the intermediate galleries rest on iron beams which also carry the enclosure railing.

These improvements in the dwellings of workpeople, taken in conjunction with the system of baths and washhouses already described, are the more valuable, because, although originating in the kind and charitable feelings of the upper classes, they are yet maintained by the exertions of the labouring classes, and keep alive in the people a spirit of honest independence. It has been well remarked by Lord Ashley, the excellent chairman of the society whose operations we have been describing, "All that is done by the wealthier classes is to provide that for the working man which he cannot obtain for himself, namely, *capital.* But having provided the capital, and the institution founded upon it, they leave the working man the duty, and the pleasure also, of maintaining it entirely. These institutions are, therefore, of singular value, because they do not place the working man in any state of dependence whatever. They enable him to turn to account his wages and receipts. They enable him to do what is more—namely, to develope all his resources, physical, moral, and intellectual."

The object contemplated by the Society for Improving the Condition of the Labouring Classes has been the erection and completion of one model of each description of building required to meet the varied circumstances of the labouring classes, and at the same time the demonstration that such buildings may, with proper management, be made to yield a fair return on the outlay. This is all that can be expected from a society depending on the public benevolence for the funds necessary to the undertaking; but the good example thus set, and the experiment thus satisfactorily tried, has been taken up and followed in various quarters of the metropolis, in a way that is calculated vastly to improve the state and prospects of the working classes of London. And not only so, but our example is spreading on the Continent, and structures are rising in Berlin and Paris, similar in character to the model lodging-houses of our great city. A valuable essay on the dwellings of the labouring classes having been published by Mr. Henry Roberts, Architect, Honorary Architect to the society of which we have been speaking, it is gratifying to learn that it has been translated into French, and published by order of the President of the Republic, with the following prefatory remarks:—

"This work is addressed to all good men, to all who love their country. It is offered to them as a sign of the lively interest which is awakened in another country for the amelioration of the condition of the labouring classes—it is offered as an example which may inspire them to imitation.

"To provide for labourers in this country, as well as in towns, dwellings well lighted, well ventilated, dry, and clean: such is the first problem to be solved.

"We do not hesitate to say, that long since this problem would have been solved if every person was fully convinced that, these conditions once realized, a multitude of the causes of sickness, of misery, of disorder, and of corruption would disappear.

"Who is the physician, ignorant of the fact that the want of light, vitiated air, dampness, and surrounding dirt, are as many causes which, singly, and with much greater certainty when united, contribute more than everything else to shorten life, and to render it miserable, by inflicting on those who are exposed to them, a multitude of personal and hereditary infirmities? Who is the moralist who does not admit that the human soul itself becomes degraded under the prolonged influence of such conditions? Who is the statesman who has not sighed to see all the hospitals and the prisons overcrowded with the wretched people which these causes have been the means of producing?

"Yet it is almost always easy to obtain for rural dwellings the necessary amount of light. With regard to dwellings in towns, this is a feature most deserving the attention of the commissioners charged by the authorities with this important oversight.

"The regular renewal of the air in dwellings is a new problem for science,—it has never approached it. But is it not sufficient to propose such a problem, in order that it should give to it speedily, a happy and practical solution?

"In reference to dampness, the healthiness of dwellings is everywhere a desideratum, even in the houses of the middle classes. Let us, then, direct the attention of our young architects towards this important subject. It is a great honour to be judged worthy of going to Rome; it is a great merit, in returning, to bring back the plans of some palace, destined to become the ornament of our cities; but he who finds, or who invents the art of driving away the humidity which renders unhealthy so large a number of the dwellings of our town and country labourers, will have gained a right to the gratitude of the country, and will have prepared for himself a source of imperishable satisfaction.

"In the meantime, let good men, especially let young men, teach the workmen by whom they are surrounded, to set some value on those habits of cleanliness which are the first steps taken in the path of progress towards well-being.

"It would be so easy to have in each quarter the necessary implements for washing, for sponging, for whitewashing a room or a staircase; to hang paper, to stop up holes, in order to destroy insects! The acquisition of these implements, impossible for every single workman, if made by a benevolent association, would serve to ameliorate the condition of the whole neighbourhood, almost without expense.

"At first, the persons to whom the implements would be lent, might use them badly or indifferently; but soon, with mutual instruction, every one would be able to make a good use of them. Now all this is practicable: let us then practise it.

"When our so well-disposed and ingenious population consecrates itself to such works, they will soon understand their extreme importance, and their benefits will spread with rapidity over the whole country, for the greatest happiness of the working classes."

The Metropolitan Association for Improving the Dwellings of the Industrious Classes was incorporated by royal charter in 1845, and seems destined to carry out in the highest degree the aims and intentions of the benevolent party who first attempted the bettering of the prospects of working men. This association is established on a principle which, in this business-like age, is sure to be duly appreciated, and will doubtless ensure its permanence and success, namely, that of an investment of capital, with a prospect of a fair return. It is, in fact, a commercial speculation of a very safe and honourable kind. The capital of the association is 100,000*l.*, in 4,000 shares of 25*l.* each. The rate of interest to be paid to shareholders is not to exceed 5*l.* per cent. per annum; and the liability of the shareholders is limited to the amount of their respective shares. The first buildings erected by this association were those in the Old St. Pancras Road, whose lofty and imposing appearance must have arrested the attention of every one passing that way. These were arranged to accommodate 110 families, and were opened to the tenants in 1848. They have been constantly occupied since their completion, to the great advantage and improved health of the inmates. And it is a pleasing fact, that out of the rent accruing to the association from these dwellings during two years, and which amounts to the large sum of 2418*l.*, there was only the sum of 1*l.* 19*s.* 7*d.* which could be pronounced a bad debt. This building was speedily followed by another in Albert Street, Spicer Street, Spitalfields, which was first opened for 234 single men, but also includes sixty dwellings for families, each with three rooms and a small kitchen, with water, water-closets, store.places, and every possible convenience. The building is five stories in height from the basement. The latter is surrounded by an open area, and contains baths and washhouses, with all the requisite appurtenances, extensive cellarage, and ample space for workshops. Upon the ground floor, the entrance hall is commanded by the superintendent's apartments, which are placed on the left, while the store-room and cook's apartments occupy about the same space on the right. Immediately in front of the entrance are the stairs, of fire-proof construction, which lead to the three stories of sleeping apartments; and opposite the stairs, on the ground floor, is a good-sized lavatory for day use. The coffee room is directly in front of the staircase hall, and extends to the back of the building, communicating on one side with a reading room, and on the other with a kitchen for the use of the inmates. It is a lofty room, divided into aisles by iron columns supporting an open roof of stained timbers, lighted by a large window at the further end, two smaller side windows, and sheets of rough plate in the roof. Boxes are fitted with tables and seats round three sides, and the room is warmed by hot-water pipes. A cook's bar opens into the coffee room, for the supply of coffee, etc. The reading room, size 60 ft. by 21 ft. 9 in., is warmed by open fires, and furnished with some of the daily papers and popular periodicals. The kitchen, 45 ft. by 21 ft. 9 in., for the use of the inmates, contains two ranges, provided with hot water, a sink with cold water, and common apparatus for cooking purposes. From this kitchen a stone staircase leads to a portion of the basement, containing 234 small meat safes, all under lock and key, raised on brick piers, placed in ranges back to back, with ample space for ventilation. The cook's shop is connected with the men's kitchen by a bar, from which cooked provisions may be obtained at almost any hour of the day. The three upper stories are fitted with sleeping apartments on each side of the corridors. Each compartment measures 8 ft. by 4 ft. 6 in., and is lighted by half a window, the upper portion only opening, and this is hung on centres. These rooms are all furnished with iron bedsteads and suitable bed furniture. There is also in each a locker for linen and clothes, with a false bottom for the admission of fresh air, so that the sleeping berths can be ventilated at the pleasure of the lodgers. All the doors are secured by spring latches, of which each inmate has his own key, and no key will open the lock of any other in the same wing. On each floor are lavatories, fitted with cast-iron enamel basins, set in slate fittings. The partitions forming the sleeping compartments are kept below the ceiling for the purpose of ventilation, and the corridors have windows at each end to ensure a thorough draught when necessary. With respect to ventilation, the principal agent is a shaft, which rises nearly 100 feet, into which several of the smoke flues are conveyed, and by which means a powerful upward current is maintained. The sleeping apartments and other principal rooms are connected by vitiated air flues with the ventilating shafts, and the current is regulated at pleasure by means of dampers, placed under the control of the superintendent. *Water.*—Large cisterns in the roofs, and smaller ones in other parts of the building, afford an ample supply of water to every part of the premises. *Dust.*—Every floor has an opening, secured by an iron door, into a dust shaft, communicating with a dust cellar in the basement. *Gas.*—The whole building is well lighted with gas. This building has been erected from the designs and under the superintendence of Mr. W. Beck, 33, Broad Street Buildings, and the builder is Mr. S. Grimsdell. The terms 3*s*. per week, payable in advance. Each inmate has, besides his sleeping apartment, the use of the coffee room, reading room, and the public kitchen, where he may cook his own food, or he can obtain ready cooked provisions from the cook's shop. Every lodger is furnished with a small larder under his own lock and key, has free access to the washhouse at certain times of the day, and can, by the payment of a small sum, have a hot or cold bath.

The opening of these new buildings was thus noticed in a leading article in the "Times," of Dec. 13th, 1849.—"The Metropolitan Association for Improving the Dwellings of the Industrious Classes, some time since opened a handsome building, containing more than a hundred sets of rooms for as many families, near Old St. Pancras Church, and after a year or two's trial is able to show the most happy and profitable results. It has now brought to completion a building of a similar character for single men in the eastern outskirts of Spitalfields. Yesterday, the Earl of Carlisle and the shareholders inaugurated their work for its useful purpose; and at this moment any man working in Spitalfields, or Whitechapel, or even in the city, may have, within a mile of his work, for 3*s*. per week, a good bed and a convenient partition in a well-ventilated dormitory, the use of a spacious, handsome, and comfortable coffee room and reading room, a commodious cooking room, of a washing, rinsing, and drying apparatus, of baths, and twenty other conveniences. The place is so clean, so airy, so wholesome, and altogether so inviting, that one almost longs to live in it one's self, and make use of its endless accommodations in continual succession. The warming and ventilation are complete; the latter being accomplished by a lofty shaft, which discharges smoke and foul air fifty feet above the roof of the building. *Ecce signum.* Several hundred persons yesterday met in the coffee room, which was not cold when the meeting began, nor too warm when it ended.

"By the side of this pile another is rising as rapidly as hodmen and bricklayers can carry it, for the use of families, with much the same arrangements as those in the Metropolitan Buildings of St. Pancras. The association is extending its labours, and has already spent 40,000*l*. in substantial buildings, calculated to last a thousand years, to continue in order at a very trifling cost, to pay ultimately five per cent., or even more if the constitution of the society allowed. Nay, already, with a staff too large for what it has to do, it pays as much as 2 per cent. on the outlay. For the further designs of the company, for its sober and business-like character, for its incidental benefits in provoking imitation and rivalry, for its effect on the house and lodging market, and many other points of interest, we must refer to our report of the proceedings. We can add but little to what was said yesterday, but we cannot help expressing our very warm sympathy with an undertaking which, at comparatively so little expense, and so little effort, shows results so magnificent, so substantial, so complete, and so satisfactory to all the parties concerned. It quite grieves one's heart to think of the millions wasted in useless and unprofitable railways, besides a thousand other national follies, when forty thousand pounds has produced so much happiness, health, and goodness to the inhabitants of these buildings, besides the never-to-be-forgotten profit to the shareholders. We do not hesitate to add 'goodness' to the benefit already achieved. It is a good and improving thing to be quiet, domestic, methodical, and clean; to live by rule; and, above all, to pay one's rent punctually at the stipulated time. On this last point the results of the speculation are so marvellous, that one is ready to ask where the tenantry come from, as they cannot be of common mortal mould. Excepting a few shillings, there are no arrears still due on a rental of more than 2000*l*. paid by more than a hundred tenants. Weekly tenants, however, are now known to be the most punctual as well as the most profitable. This association only proceeds upon a principle known to many hundreds of low speculators in the metropolis and all our principal towns. Nothing is more usual than for men and women to double or treble the rent they pay their own landlord by subletting their houses to the poor. This they do with an utter disregard of comfort, health, morality, or any other proper consideration. The Metropolitan Association merely steps into their place, and by supplying a better article at a less cost, drives them either to improve their accommodation or to give up their trade."

Besides the extensive and important operations of the Metropolitan Association, independent efforts have been commenced in Soho, in St. James's, in Marylebone, in Chelsea, and in the Borough; and it is gratifying to learn that the example is spreading to such an extent, that we may look forward to see the old system well nigh destroyed, for who but the most depraved is so completely lost to all sense of domestic comfort, as not to prefer a light, dry, clean, and wholesome abode, to a dark, damp cellar, when he can have the one on the same terms as the other?

In connection with this subject it should be known that as long ago as 1835, an effort was made in behalf of the seamen of the port of London, which, to a certain extent, led the way for the model lodging-house system, as now practised. In this effort one energetic naval officer was conspicuous for his unwearied and self-denying zeal, so that the buildings erected in Well Street, London Docks, may be considered a monument to the memory of one whose whole life was devoted to the good of sailors. This was the late Captain R. J. Elliot, R.N., whose open-hearted kindness and Christian charity are strong in the remembrance of the writer of this notice. How earnestly did he labour to procure a home for sailors, where they might be safe from the snares laid to entrap them as soon as they came ashore, and how zealously did he promote the building of an asylum for the sick and destitute! Nobly was he seconded by other officers and friends of sailors, while the design of an asylum was generously bestowed by the same architect, H. Roberts, Esq., who has since given his honorary services to the Society for Improving the Condition of the Labouring Classes.

The Sailor's Home was opened in 1835, the cost of fitting up the last dormitory having been defrayed at the sole expense of her lamented Majesty, the Queen Dowager, a munificent patroness of the society just named, as well as of numerous other charities, and who is well known to have taken an especial interest in the well-being of sailors! The Sailor's Home will lodge three hundred inmates, and is altogether admirably conducted. The Destitute Sailors' Asylum, in the same street, is likewise a useful institution, and its arrangements are well worth imitation in lodgings for the lowest class, such as ragged school boys, and common beggars—a description of lodging-house much needed, and which has not yet, as far as we know, entered into the plans of either of the great societies now in operation. To make the whole system for the good of sailors complete, a church for seamen frequenting the ports of London has been erected in Dock Street, London Docks, where the sittings are all free, and where commanders of vessels, mates, seamen, apprentices, and friends of sailors are invited to attend. The incumbent of this church is the Rev. C. B. Gribble, M.A. The services are on Sunday morning at half-past ten, evening at six, and on Thursday evening at seven o'clock.

BREWERIES.

The Breweries of the metropolis may be considered as amongst its most important manufacturing establishments, whether in reference to the capital employed, to the extent of their premises, or to the age of the eight great establishments known as the London porter breweries.

Before we proceed to a description of the process of brewing, or of the establishments themselves, we will give a slight sketch of the history of beer and brewing, which will enable our readers better to appreciate the extent of the present trade in beer than they would be able to do if we confined ourselves simply to a description of the process of brewing or to a statistical notice of the quantities of beer brewed by certain houses.

Beer, then, was known to the Egyptians; but this was a fermented liquor without the addition of any bitter, made from corn of various kinds, but principally from barley. The same description of beverage is mentioned by Tacitus, and it continued to be manufactured until the Germans, from whom we learnt the art of brewing, made the first great improvement in the quality of beer, by adding to the saccharine solution an infusion of hops with a view to its preservation, and to give it that beautiful aromatic bitter flavour which now so thoroughly distinguishes the beer of England from that of every other country in the world. Were no other evidence at hand, the name at once denotes its origin, leaving no room to doubt, that in adopting the beverage we also adopted the name, corrupting the German word "bier" into our English "beer." We also learn from Stowe that so lately as the reign of Elizabeth more than one-half the brewers of the metropolis were foreigners. Long, however, before beer as it is now brewed was known, England was famous for its ale. Shakspeare tells us "A quart of ale is a dish for a king;" and numerous proofs might be afforded to show how popular this beverage has always been in this country. We cannot, however, spare space to trace the gradual improvement in the quality of beer to the time when the virtue of the hop plant was thoroughly known. We must therefore confine ourselves to the simple statement of the fact that, until a bitter principle was added to malt liquor, no beer worthy the name was brewed; the ale of our forefathers being the fermented extract from malt, sweet and luscious in flavour, very intoxicating, would not keep for any length of time, and various extracts from herbs and berries were added to it with a view to preserve it sound and in good condition. The introduction of the hop plant, however, to this country, in the 14th century, and its subsequent careful cultivation, not only altered the character of the beer, but, from its preservative properties and delicious flavour, made the business of brewer one of commercial importance, requiring for its full appreciation a sound knowledge of chemistry, and that practical turn of mind which distinguishes in all trades the successful, because practical, from the theoretical manufacturer. The extent of the trade in beer so far back as 1585 is shown by the fact that 650,000 barrels were then brewed in the metropolis; a quantity, it is true, but little greater than is now delivered annually by one brewery, that of Messrs. Barclay, Perkins, and Co., but still a very large quantity when the period is considered. We may mention here that the Brewers' Company was incorporated in 1427, just the period of the first cultivation of the hop plant in this country, and therefore no doubt an era in the trade, thus well marked, when a beverage was first brewed, that was calculated to displace the use of other fermented liquors by the working classes; it being essentially suited to supply a healthy stimulus to them, without necessarily encouraging habits of intemperance, and thereby want and misery; and being, in the words of Pennant, "a wholesome liquor, which enables London porter drinkers to undergo tasks that a gin drinker would sink under." Happy, indeed, would it have been had they been able, in the early part of this century, when food was dear, and the means of obtaining the necessaries of life almost beyond their reach, if they could have resisted the temptation which was most artfully placed before them, to displace this truly English and wholesome beverage for that ardent spirit gin. Fortunately, however, this fatal passion, which seemed to have taken possession of the working classes for a time, is gradually dying away; and whilst the consumption of spirits, if not decreasing, is stationary, with an increasing population, that of beer, the purity and quality of which is now superior to that of any former period, is steadily increasing.

Beer has always contributed largely to the revenue of the country. An excise duty was first placed on beer in the reign of Charles II., but was, happily for the industrious classes, who are the great consumers of malt liquors, repealed in 1830. The duties on malt and hops are of a later date, that on hops having been imposed by the 9th, and that on malt by the 12th of Anne. These duties now produce nearly 5,000,000*l.* annually to the revenue.

We will now proceed to give a general outline of the process of brewing as adopted in our great breweries.

The art of brewing consists mainly in the extraction of a saccharine solution from grain, and boiling it with certain proportions of hops, by which the aromatic bitter is extracted from them, and in converting this mixed solution into a fermented and sound spirituous beverage called beer (porter and stout) and ale. It is for porter and stout that the London brewers have obtained a world-wide reputation, and our brief account of the process will refer principally to that description of beer.

The malt used is generally a mixture of pale brown and roasted, or pale and roasted malt, the proportions depending upon the quality of the pale malt, which varies with the season. It is first crushed (not ground) between cylindrical iron rollers, nicely adjusted so as to break every corn. The malt so bruised is then thrown into the mash-tun, where it is intimately mixed with warm water by means of a stirring or mashing machine worked in all large establishments by the steam-engine. The mash-tun is a circular wooden vessel with a pierced and movable false bottom, into which the water, or liquor, as it is called by brewers, is admitted, and from which the wort is afterwards drawn off into an under back, from whence it is pumped into the copper, where, the hops being thrown in, boiling commences. This is continued until the wort is of the specific gravity required, when the contents of the copper are let off through a large valve into a vessel called the hopback, from whence it runs into the coolers. This vessel, like the mash-tun, has a movable perforated false bottom, through which the wort runs, leaving the hops only partly spent, ready for use again with the second wort from the malt.

The coolers are large shallow wooden vessels exposed as much as possible to the air; but as it is of great importance that the cooling should take place very rapidly, various mechanical means are used to accomplish this object. Large fans, revolving with great rapidity, and driven by the steam-engine, create a strong current of air through the floor over the hot worts; but as in the greater part of the year this would not produce the required effect with sufficient rapidity, all large breweries have a refrigerator—a worm of copper pipes placed in a shallow trough, through which a constant stream of cold water passes, entering at one end and running away at the other, the hot wort running into the trough in which the refrigerator is placed at that end where the water passes away. By these means united, where there is a good supply of cold water, and powerful machinery to drive the fans, the worts are cooled from the boiling temperature to about 60° in a short time, even in summer weather.

From the cooler the beer runs into the fermenting tuns, and here the difficult and delicate part of the brewer's duty begins; for as each description of beer requires a fixed degree of attenuation (as the result of fermentation is called), and as the progress of fermentation is more or less active according to the state of the weather, a large quantity of beer may be spoiled and rendered useless unless the brewer be always on the spot ready to stimulate or check the process, as the circumstances require. The appearance of a large tun in a state of active fermentation is curious—a creamy scum first arises, which soon curls and assumes the appearance of a thick froth; it then becomes coarser, and looks rocky and rugged, and the small bubbles or vessels swell and become large bladders charged with carbonic acid, which burst and cause that sweet pungent flavour familiar to every one who has been in a brewery. At this stage of the fermentation the beer is run out of the large tun into small vessels containing about five barrels each, called "pontos," where the heavy yeasty head is thrown off and is received into vessels below. When the fermentation ceases the beer is "cleansed" and fit for storing. Here the business of the brewer ceases—the storing, the fining before sending out or in the cellar of the dealer, are subsequent processes which are determined by special circumstances, quite irrespective of the brewer or brewing, and into which we cannot stop to inquire.

The machinery and apparatus required for a large brewery is extensive and costly. The size of the apparatus necessary to produce the 1000 or 1200 barrels, or nearly 50,000 gallons of beer, delivered daily by Messrs. Barclay and Co., and Messrs. Truman, will be best conveyed to the reader's mind by stating that 150,000 gallons of water must be pumped daily, from sources of supply 200 to 300 feet below the surface of the earth to a height of 80 or 90 feet above it; that they grind and brew above 100,000 quarters of malt annually; employ 200 to 300 horses; have vats in which they store the beer brewed in the winter for the supply of the trade in the summer, containing from 4,000,000 to 5,000,000 gallons of beer; use steam power to the extent of 100 or 120 horses; consume from 4000 to 5000 tons of coal annually; have 80,000*l.* or 100,000*l.* invested in casks alone; employ from 400 to 500 persons; and require, at the two large establishments we have referred to, from 8 to 10 acres of ground on which to conduct this vast amount of business.

We have already stated that until lately London was only famous for its porter and stout. The release of the beer trade in 1830 from the shackles of the excise first gave an impetus to the ale trade, and soon raised it into importance. Before that time beer as well as spirits was only sold in houses licensed by the magistracy. The new Beer Bill, by allowing it to be sold under an excise licence only, opened the trade to a new class of dealers, who at once took up the ale trade, and were the immediate cause of the success of several new breweries which at first devoted themselves to the production of a class of malt liquors to compete with the old-fashioned porter and stout of the old-established porter brewers. The effect of this competition was so striking, that nearly all the porter brewers soon became ale brewers also, and the new ale brewers became also porter brewers, so that by referring to the list we shall introduce hereafter, it will be seen, that whilst the old brewers have rapidly extended their trade from 370,000 quarters in 1830, to 500,000 quarters in 1850, or 33 per cent., the six new breweries have risen in the same time, from 57,000 quarters in 1830, to 110,000 quarters in 1850. But for the wise alteration of the law in 1830, this enormous increase of trade must have been monopolized by the first houses, the public would neither have had such cheap nor such good beer, and the retail trade would have been confined now, as it then was, to licensed public-houses, nine out of every ten of which either belong to, or are under the control of, the large porter brewers. It is quite a different state of things with the best beer retailers, who buy their beer where they can get it the best and the cheapest, and whose business, confined as it is to the sale of beer, can only be retained, as in all other trades, by the supply of the best and cheapest article.

The rapidity with which two or three of the new breweries have risen is one of the evidences of the facility with which capital is found in this country for every enterprise which shows a fair prospect of realizing a profit; though rapidly as these have extended their operations, it hardly equals that of their older rivals, for it is scarcely 70 years since that the vast establishment of Messrs. Barclay, Perkins, and Co., now employing a million and a half of capital, was bought of the executors of Thrale, the friend of Johnson, for the sum of 135,000*l.*, Mr. Perkins having been previously to that time the manager of the brewery at a salary of 500*l.* per annum. The rise of Messrs. Truman and Co. has been equally wonderful. We will close this account of the London breweries, almost national establishments from their vastness, by a table showing the quantity of malt used in the fifteen largest houses in each of the three years, 1830-1, 1840-1, 1849-50.

	1830-1	1840-1	1849-50
Barclay and Co.	97,198	106,345	115,542
Truman and Co.	50,724	88,132	105,022
Whitbread and Co.	49,713	51,482	51,800
Reid and Co.	43,380	47,980	56,640
Coombe and Co.	34,684	36,460	43,282
Calvert and Co.	30,525	30,615	28,630
Meux and Co.	24,339	39,583	59,617
Hoare and Co.	24,102	29,450	35,000
Elliott and Co.	19,444	25,275	29,558
Taylor	21,845	27,300	15,870
Goding	16,307	14,631	13,064
Charrington	10,531	18,328	21,016
Courage	8,116	11,532	14,469
Thorne	1,445	20,846	22,022
Mann	1,302	11,654	24,030
	433,655	559,613	635,562

We believe we may state that most of these establishments will be open to the inspection of respectable foreigners during the period of the Exhibition. We are sure they will find them well worthy of their attention, and will amply repay the time and trouble required to visit them.

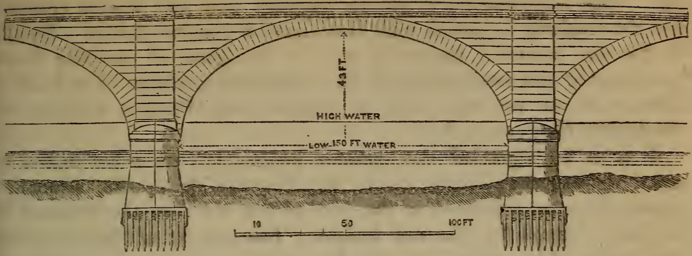
BRIDGES.

THERE are few constructions in our metropolis capable of comparison with the bridges which span the broad waters of the Thames, whether we regard them as mere works of art, or as ensamples of the skill of our engineers. Some of them, such as the Westminster and Blackfriars' Bridges, were, it is true, erected before the peculiar action of our tides was ascertained (in fact, they were designed for a river with a totally different *régime* to that which now prevails), and before the nature and properties of the different materials were so well studied as they have been of late. Serious movements have been observed in them, of sufficient importance to menace their instant ruin; but, nevertheless, even these bridges were remarkable proofs of the boldness and skill of their projectors; and their construction, equally with their failures, have proved useful lessons to all interested in such studies.

Foreigners often remark with surprise the small number of these structures over the Thames; and really the contrast between the innumerable bridges over the Seine with those, so few and far between, upon our river, is very striking. But, at the same time, the difference between the width and the volumes of the two rivers is equally striking; and it is, undoubtedly, on account of the great difficulties attending the foundations of such structures in the Thames, that we possess so few points of communication between its opposite shores. The Seine, in its progress through Paris, is traversed by twelve or thirteen bridges within a distance certainly not equal to half of that traversed by the Thames through London, yet the latter can only cite seven such structures. The character of the bridges is, however, totally distinct; and it is not too much to assert that the cost of the latter has far exceeded that of the former, and that the difficulties overcome have been immeasurably superior.

Taking the bridges over the Thames in a geographical order, they are—1, London; 2, Southwark; 3, Blackfriars; 4. Waterloo; 5, Hungerford; 6, Westminster; and 7, Vauxhall. Battersea, Putney, Hammersmith, Kew, Richmond, and Staines Bridges, with the Railway Bridges at Barnes and Richmond, can hardly be considered connected with the metropolis. They merit attention for divers reasons however. Battersea and Putney on account of their supreme ugliness and great inconvenience; Hammersmith and Staines Bridges upon precisely opposite grounds; the Railway Bridges on account of their economical construction; Kew and Richmond Bridges, as samples of the bridge-building of some fifty years since.

1. *London Bridge.*—This magnificent structure was erected under the superintendence of Mr. George and Sir John Rennie, upon the designs prepared by their illustrious father, Mr. John Rennie. Old London Bridge, after nearly a century of discussion, had been almost universally condemned as a nuisance to the navigation, and a disgrace to the architectural character of the town. In spite of serious opposition, it was at length decided that it should be removed; and, in 1823, an Act of Parliament was obtained regulating the mode of execution of the new bridge, and creating the ways and means of defraying the expense. The first pile was driven on the 15th of March,



LONDON BRIDGE.

1824; the foundation stone of the first pier was laid on the 15th of June, 1825; and the bridge was opened by King William the Fourth on the 1st of August, 1831.

The elevation of the New London Bridge consists of five semi-elliptical arches, with their respective piers and abutments. The centre arch is 152 ft. 6 in. span, with a versed sine of 29 ft. 6 in. above high-water mark; the piers between it and the second and fourth arches are 24 ft. thick each, measured on the longitudinal axis of the bridge. The second and fourth arches are each 140 ft. span, with a versed sine of 27 ft. 6 in.; their piers on the respective land sides are 22 ft. thick each. The first and fifth, or the land-arches, are 130 ft. span each, with a versed sine of 24 ft. 6 in.; the abutments on either side being 73 ft. thick. The upper portions of the piers form square pilasters upon the face of the bridge; their lower portions are protected by advancing cutwaters, which are described by portions of circles, meeting at an angle of 60°. The arches and piers are surmounted by a bold plain blocking course, which corresponds with the inclination of the roadway of the bridge, and is terminated by a solid parapet. At each extremity, and upon both sides of the bridge, are two straight flights of steps, with two intermediate landings for the facility of embarkation in each.

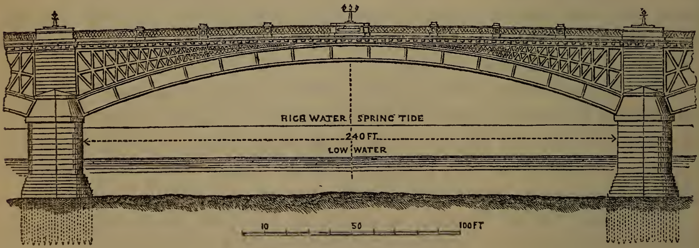
The width of the carriageway is 36 ft.; that of each of the footpaths is 9 ft.; that, measured from outside to outside of the parapets, is 56 ft. The total length of the waterway is 692 ft.; including the abutments and piers, the bridge is 928 ft. long. The total height of the carriageway in the centre above the low-water line is 55 feet.

The whole of the exterior masonry of this bridge was executed in granite obtained from Aberdeen, Haytor, and Peterhead, without any apparent reason for the mixture. The workmanship is as well executed as it is usual to see it in works executed under the control of engineers; though the manner in which many of the voussoirs were flushed, even at first, would rather indicate that proper attention was not paid to the mode of placing them. The filling-in was of Bramley Fall, Derby, and Whitby stone, mingled with the materials derived from the pier of the old bridge, demolished previously to commencing the new one. The footpaths are of granite flagging, from the Haytor granite; and the roadway is paved with deep narrow granite stones. Details of the very beautiful centering, and of the mode of carrying down the thrust of the land-arches to the horizontal surfaces of the abutments, are to be met with in Britton and Pugin's *London*, in Tredgold's *Carpentry*, &c.

It is to be regretted that greater precautions were not taken to guard against the danger to be apprehended from the alteration expected to be produced in the bed of the river by the removal of the dam formed by the old bridge. The nature of this, and the importance of its action upon the flow of the river, may be estimated from the fact, that the waterway at low-water was so contracted by the starlings of the old bridge as only to leave a clear space of 231 ft. at low-water, and to give rise to a cascade of not less than 5 ft. 7 in. between the low-water above and below the bridge, at certain periods. The removal of this dam has necessarily modified the flow of the river to an extent alluded to in the introductory part of this work; one of its most disastrous effects has been to compromise the safety of several of the bridges; amongst which, unfortunately, the magnificent structure under notice must be included.

It is also very much to be regretted that the city authorities have not prevented the encroachments, alike remarkable for their bad taste and their opposition to public interest, which have lately been allowed to mask the proportions of the noble structure erected at such an expense.

The great works connected with the approaches to the New London Bridge were so intimately connected with it, that it would be impossible to state precisely its cost. As an approximation, we may consider it to have been about one million pounds sterling.



SOUTHWARK BRIDGE.

2. *Southwark Bridge.*—This bridge was also designed by the late Mr. John Rennie, who directed its execution throughout. At the time of its erection it was regarded as a master-piece of engineering science; and even at the present day, although the late researches of such men as Tredgold and Hodgkinson have led to a knowledge that the material has not been employed in the most economical condi-

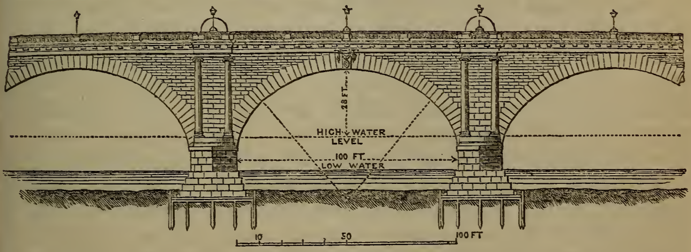
tions, yet still Southwark Bridge must ever remain a monument of the genius and practical skill of the eminent engineer who designed it.

Southwark Bridge consists of three segmental arches of cast iron, the centre one of which is 240 ft. span by 24 ft. versed sine; the piers are 24 ft. wide; the two land arches are each 210 ft. span, with 21 ft. rise; the width between the parapets is 42 ft. The abutments have flights of steps to the water, as at the London Bridge. The middle arch is composed of eight ribs, of 13 voussoirs in each, whose depth at the crown is 6 ft., and at the springing is augmented to 8 ft.; they are bolted to diagonal cross bracing, maintaining the rigidity of the system. The total height of the centre arch, from the low-water line to the roadway, is 55 ft. The side arches are constructed upon the same principle as that in the centre, and the courses of the masonry are radiated in the thickness of the abutments, so as to bring the thrust upon the horizontal bed of the foundations.

The total weight of the cast iron in this colossal structure is said to be 5780 tons; the weight of the wrought iron is at least 50 tons. The piers and abutments are of Bramley Fall, and Whitby stone; and the sheet piling originally driven round them appears to have effectually protected their foundations.

The clear water way is 660 feet; the width from face to face of the abutments is 708 ft., the Thames being narrower at this point than at any other during its passage through the metropolis, properly so called.

The works of this bridge were commenced on the 23rd of September, 1814; the first stone was laid on the 23rd of May, 1815; and the bridge was opened on the 7th of June, 1817. It was built by a joint-stock company, who have a right to levy toll upon all parties using it. The total expense of the bridge, and of the approaches, amounted to about 800,000*l.* sterling.



BLACKFRIARS' BRIDGE.

3. *Blackfriars' Bridge.*—On the 7th of June, 1760, the first pile of this bridge, for many years the only means of communication between the Middlesex and Surrey shores, from Westminster to London Bridges, was driven into the middle of the river. The first stone was laid on

the 31st of October in the same year, and in 1770 the work was completed, having thus occupied no less than ten years and three quarters.

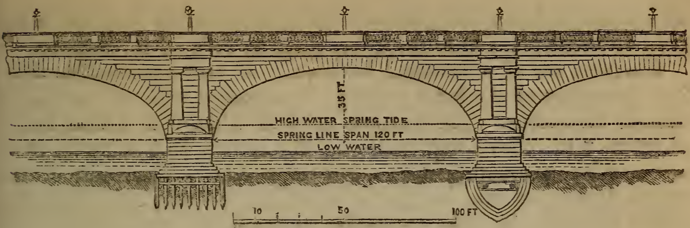
It was built upon the designs of Mr. Robert Mylne, and consists of nine semi-elliptical arches; the central one being 100 feet span, and those on each side diminishing gradually. Their spans are respectively 98, 93, 83, and 70 ft. The total length of the waterway is thus 788 ft.; the distance from face to face of abutments is 996 ft.; the width of the carriage way is 28 ft., and there are raised footpaths, on each side, 7 ft. wide. Originally the cornice was surmounted by an open stone balustrade, which returned in the recesses formed over the Ionic columns and pilasters placed, somewhat incongruously, upon the projecting portions, or cutwaters of the piers. The ends of the bridge widen out into quadrant corners, and they have flights of steps leading to the water.

The original net expense of building this bridge was about 152,840*l.*; but owing to the nature of the foundations, and of the materials employed, it has been repaired so often as almost to have given rise to an outlay equal to the first cost. The foundations were laid by Mr. Mylne upon caissons, sunk upon piles driven so as to leave an even surface; the upper structure was executed in Portland stone. Such settlements took place in consequence of these defective systems of construction, and of the decay of the stone, that Mr. James Walker was employed, about 1833 and 1834, to repair the bridge thoroughly. This work was effected with great skill and ingenuity; but unfortunately not in so perfect a manner as to secure the bridge against future accidents, for in the present day its state inspires serious apprehensions. The taste of Mr. Walker's alterations upon the ornamental parts of Mylne's original design is, perhaps, questionable. Columns and pilasters are always out of place in the elevation of a bridge; but as long as they were retained it certainly appears that it would have been preferable to have retained at the same time all the other details connected with them, and not to have altered their proportions.

4. *Waterloo Bridge.*—Canova used to declare that this was the finest work of modern times; but the subsequent erection of London Bridge, and of more modern railway constructions, have diminished, to our eyes, the beauty and merit of this noble bridge, for which we are again indebted to the genius and skill of Mr. John Rennie.

It consists of nine semi-elliptical arches of equal span and rise (namely, 120 ft. span by 35 ft. versed sine), with piers 20 ft. thick. The width of the carriageway is 28 ft., with two raised footpaths, each 7 ft. wide, defended by an open balustrade, with a frieze and cornice.

The piers are made with a batter from their foundations to the springing of the arches. At the former level they are 30 ft. thick, at the latter 20 ft., as above stated. Their width from point to point



WATERLOO BRIDGE.

of the cutwaters is 85 ft.; and they are surmounted, in the parts where they project beyond the line of the bridge, by two Grecian Doric columns on each pier, supporting a recess upon the roadway of the bridge. The total waterway thus left is 1080 ft., measured on the line of the springing of the arches. The clear height above high water is 30 ft., measuring to the underside of the keystone. The abutments are 40 ft. thick at the base, and 30 ft. thick at the springing; they are 140 ft. long, including the stairs on each side.

The roads or approaches to this bridge are nearly as remarkable as the bridge itself. They are carried upon a series of semicircular arches, 16 ft. span. On the Surrey side there are not less than thirty-nine of these arches, besides an elliptical one of 26 ft. span over the Belvidere Road, and a small embankment about 165 yards long. The whole length of the brick approaches on the Surrey side is 766 ft.; that on the Middlesex side is 310 ft.; and the total length of the bridge from the ends of the abutments is 1380 ft., making a total length of 2456 ft.

The total cost of this bridge was about 1,000,000*l.*; and it has proved a sad speculation for the shareholders, who erected so noble a monument. Their only consolation must be that the works were so judiciously executed as to enable them to remain intact notwithstanding the changes in the bed of the river. It is to be remarked, that the works entirely constructed by the late Mr. Rennie have resisted these changes better than any others.

5. *Hungerford Bridge.*—A very remarkable adaptation of the suspension principle has been lately made at this bridge, by Mr. I. K. Brunel. The span is, perhaps, the largest of any existing work of the kind; but the economy in the materials is far from being equally admirable with the conditions of their employment.

The Hungerford Bridge consists of a main span of 676 ft. 6 in. between the piers, with a clear distance between the abutments of 1352 ft. 6 in. The main chains have a deflection of 0·074 of the chord line considered as unity, or about 50 ft. They are double on each side, or there are four chains in all, consisting of alternately ten and eleven links, each of which are 24 ft. long, and of iron 7″ × 1″; excepting upon the piers, where the number of links in each chain is respectively eleven and twelve. The side chains enter the abutments below the roadway, which is supported upon the lower parts by standards, and in the upper parts by rods $1\frac{3}{4}$ in. diameter.

The piers are of ornamental brickwork, of very questionable taste, and apparently of doubtful solidity, if compared with the enormous mass of the chains. The platform is 14 ft. wide, with a clear height of 32 ft. 6 in. above high water in the centre, and of 28 ft. 6 in. at the sides, presenting thus a rise of 4 feet. The span of the centre division of this bridge is, however, the only part worthy of notice, for there is little co-relation between the dimensions of the different parts of the work. The chains would support any possible load of carriage traffic; but the suspension rods are barely more than sufficient for the purposes the bridge is actually used for, and the piers are comparatively feeble.

Hungerford Bridge places the west end of London in direct communication with the worst part of Lambeth. The construction of this bridge is indeed a phenomenon, when we consider the state of its southern access; and the enormous expense it gave rise to has certainly not been justified by its commercial results. It is said to have cost not less than 100,000*l.*

6. *Westminster Bridge.*—This structure, which will soon either be demolished, or fall of its own accord, was for many years regarded as a triumph of engineering. Had it been erected in a river with a less changeable *régime* than that of the Thames, or had the original conditions of the flow of that river been still maintained, Westminster Bridge might still have resisted, until the natural decay of its materials had rendered its removal necessary. But when the dam created by the Old London Bridge had disappeared, the scouring action of the tides soon affected this, the nearest bridge chronologically.

Labelye, the architect of Westminster Bridge, introduced a system of foundations which has answered very well in numerous cases, but which failed utterly here. It consisted of dredging the intended position of the piers, and sinking caissons with the lower courses already built upon them. During the progress of the works some trifling disturbances of the bed of the river gave rise to settlements, which were easily repaired at the time. Upon the enlargement of the tideway, however, the increased scour of the river became such as to carry away the substratum of several of the piers; and now, after many years' labour, great expense and much discussion, it seems to be allowed on all hands that the total demolition of the bridge is necessary. The great waste of public money on these repairs may, perhaps, be accounted for by the fact of the existence of a commission for the superintendence of the works, paid out of the proceeds of the bridge estates.

Westminster Bridge is 1223 ft. in length by 44 ft. wide, and consists of a carriageway with two footpaths. There are thirteen large, and two small, semicircular arches, springing about 2 ft. above low-water mark. The centre arch is 76 ft. span, and the others decrease on each side by regular intervals of 4 ft. each, excepting the small arches, which are 25 ft. span each. The clear waterway at the springing line is 874 feet.

The material employed in the superstructure of this bridge is the Portland stone, which has certainly not withstood the action of the moisture and atmosphere it has been exposed to.

The first stone of this structure was laid on the 29th of January, 1739; and the last on the 10th of November, 1750; the time occupied in its erection being thus eleven years and nine months. The total expense, including the repairs of the pier, which sank during the erection, was 389,500*l.*

7. *Vauxhall Bridge.*—The second cast-iron bridge erected over the Thames is far from being of an equally monumental character with its contemporary at Southwark. It is, in fact, very plain, if not decidedly ugly, the disagreeable effect being attributable to the vertical spandril filling, and the balustrade.

There are nine arches of equal span, whose chord line is 78 ft., and whose versed sine is 11 ft.; the width of the piers is 12 ft. at the springing of the arches; the breadth of the roadway is 36 ft.; and the whole length of the bridge, from face to face of the abutments is 798 ft., measuring from the springings. There are ten girders in each opening, of three pieces each. The height above high water to the under side of the arch is 29 ft.

The first stone was laid the 9th of May, 1811, and the bridge was opened July, 1816. The engineer was Mr. James Walker, who completed it for the sum of about 300,000*l.*

Tabular View of the Bridges across the Thames.

	Length.	Width.	Height.	Arches.	Span, centre.	Materials.	Waterway.
London . . .	928	56	55	5	150	Granite	690
Southwark . .	700	42	53	3	240	Iron	660
Blackfriars . .	996	42	62	9	100	Portland	793
Waterloo . . .	1326	42	54	9	120	Granite	1080
Hungerford . .	1352	14	32	3	676½	Iron	—
Westminster . .	1066	42	58	15	76	Portland	820
Vauxhall . . .	798	36	—	9	78	Iron	702

We may mention that, in consequence of the requirements of modern locomotive habits, piers for the embarkation of passengers by the river steamers have been erected at several of the above bridges. They are many of them very remarkable for the constructive ability displayed in their designs, especially those at Blackfriars and Hungerford Bridges. The piers at Southwark, Waterloo, Westminster, and Vauxhall, are simpler; but under their peculiar local conditions equally efficacious. The engineer who would desire to study this class of constructions, would do well to examine those at East Woolwich and on the opposite Middlesex shore.

For further information upon this subject consult Weale's Work upon Bridges, and the Supplement; "The Public Works of Great Britain;" "Tredgold's Carpentry (the Centres);" etc.

CANALS.

The canals of London have lost much of their importance, both in a political and commercial point of view, like all similar constructions, in consequence of the more rapid means of transport offered by railways. That they are susceptible of still rendering great service to the public, and of producing a better interest to their shareholders, if managed upon other principles than those hitherto adopted, is, however, certain. But it is also to be observed, that in no country in the world is the maxim that, "time is money," so invariably practised as in England; and it is to be feared that its universal application will lead to the gradual abandonment of the cheap but comparatively tedious mode of transport offered by canals.

The works for the improvement of the internal navigation of the streams leading to London appear to have occupied the attention of government at an early period of our national history. In 1423 a commission was issued for the improvement of the river Lea, and shortly afterwards the present system of management of the navigation of the Thames was established in its essential details. In the reign of James the First, the upper portion of the river as far as Oxford was rendered navigable. In the reign of Charles the Second many such works were executed. It was not, however, until the latter end of the eighteenth century that extensive works connected with the creation of lines of artificial navigation were undertaken. At the present day it is calculated that there are not less than 2400 miles of navigable canals in England.

Near London, however, the number of such works is very limited. The Thames, the Lea, the Kennet, and some of the other tributaries of the main stream, have been canalized, as already mentioned in our introduction. The artificial canals which lead into the Thames, or pass directly into London, are the Grand Junction, the Oxford and Birmingham, the Thames and Severn, the North Wilts, the Kennet and Avon, and the Basingstoke Canal. The Thames itself is canalized as far as Lechlade; the Lea, as far as Ware; the Wey, as far as Godalming. The canals which really pass through London are the Paddington Canal, the Regent's and the Surrey Canals, and the Lea Cut and Sir George Ducket's Canal. The Croydon, and Thames and Medway Canals have been diverted from their original destinations to be turned into railways.

Examining these canals in a geographical order, we meet firstly the Thames and Severn, which leads from the Stroudwater Canal at Wallbridge, near Stroud, to the Thames navigation at Lechlade. It was executed under the orders of R. Whitworth about 1793, and is about 30 miles long. The breadth on the water line is 42 ft.; at the bottom it is 30 ft., with a depth of 5 ft. The barges used on this canal are 80 ft. long, and draw 8 ft. of water when at their full load of 70 tons. From Stroud to Sapperton, in a distance of 7 miles 3 furlongs, there are 28 locks to overcome a rise of 241 ft. 3 in.; the summit is passed by a tunnel 4500 yards long, and only 15 ft. wide, the rock above it being in some parts as much as 250 ft. The difference of level down to Lechlade, 136 ft. 6 in., is overcome by 14 locks. There is a branch from this canal to Cirencester, and at Lutton it receives a branch from the Wiltshire and Berkshire Canal.

The Wiltshire and Berkshire Canal makes a junction from the upper part of the Thames to the Kennet and Avon Canal, through Wantage, Calne, and Chippenham. The point where it locks into the Thames is about 180 ft. 4 in. above the sea; from thence to a point near the commencement of the Wantage River, in a length of 7¾ miles, it rises 96½ ft.; thence to the east end of the summit level, in a length of 15 miles, it rises 71½ ft. The head level is 9⅜ miles long. From the west end to the branch to Calne, the fall is 130 ft. in 10¾ miles; thence to the Chippenham branch, in 1½ mile, there is a fall of 17 ft.; thence to the Junction with the Kennet and Avon Canal, there is a fall of 54 ft. in 7⅜ miles. This canal was constructed in 1795; its total length being 52 miles nearly, with a total rise of 168 ft., and a total fall of 201 ft.

The Oxford Canal, executed in 1769, commences at Longford, on the Coventry Canal, where it is 312 ft. above the level of the sea. The summit level is at Marston Wharf, where it is 387¼ ft. above the sea; from thence it falls towards the Isis at Oxford, where it is still 192 ft. above the same level. In the valley of Brinklow there is a viaduct of twelve arches, each 22 ft. span; at Cosford and at Clinton are two others. There is a short tunnel at Newbold 125 yards long, and another at Fenny Compton 1118 yards long. The total length of the canal itself is 84 miles. On the water line the width is about 28 ft., with a depth of water of about 5 ft. The smallest locks are 75 ft. 6 in. long by 7 ft. wide.

The North Wiltshire Canal is merely a connection between the Thames and Severn, and the Wiltshire and Berkshire Canal. It begins on the latter, near Swindon, at an elevation of 345 ft. above the sea, and falls into the former at Weymoor Bridge. Its total length is about 8½ miles; the total fall is 58 ft. 6 in.; the date of construction 1813. There are no very important works upon it.

We next meet the Kennet and Avon Canal, by means of which London is placed in direct water communication with Bath and Bristol, and the lower part of the Severn. It was executed in 1794 by the late Mr. John Rennie. The total length is 57 miles from the point where the canal locks into the Kennet at Newberry, in Berkshire, to the junction with the Avon about one mile beyond Bath. The rise from the Kennet to the summit level is 210 ft., which is effected by 31 locks; the descent into the Avon is 404 ft. 6 in., with 48 locks; the summit is 474 ft. above the level of the sea. At the bottom the canal is 24 ft. wide; on the water line it is 44 ft. with a depth sometimes of 6 ft., but usually only of 5 feet. The locks are 80 ft. long between the sallies of the gates by 14 ft. wide, to suit barges carrying from 50 to 70 tons. There are two aqueducts of some importance in the valley of the Avon, but no other works calling for particular notice. The total cost of this canal is said to have been 881,369*l.* nearly, or about 15,463*l.* sterling per mile. The

Kennet is canalized from Newberry to Reading, a distance of 18½ miles, in the course of which a fall of 126 ft. is overcome by means of 20 locks. From the town of Reading itself to the Thames, there is a navigable cut about 1½ mile long, with a lock into the river. The width of the cut is about 54 ft. on the average; the depth 5 ft.; the locks are 120 ft. long by 19 ft. wide, and they receive boats drawing 4 ft. of water.

Further down the river we meet the Basingstoke Canal and the Wey Navigation. This affluent of the Thames is rendered navigable from its junction near Weybridge to Godalming. In the portion from the Thames to Guildford, a distance of about 20 miles, there is a rise of 68 ft. 6 in; thence to Godalming the rise is 34½ ft. At a point between Guildford and Godalming, near Shalford Powder Mills, the Wey and Arun Canal begins, and by it the Thames is placed in connection with the south coast of England, for this canal terminates in the Arun River, after a course of 18 miles. The locks upon the Wey are 81 ft. long by 14 ft. wide; the boats intended to navigate it, as well as the Wey and Arun Canal, have only a draught of water of 3 ft. 1 in. At 3 miles from the junction of the Wey and the Thames is the point at which the Basingstoke Canal locks into the former river. This canal, constructed in 1778, is 37 miles long, and it rises to the summit level near the river Blackwater 195 ft., within a distance of 15 miles, by means of 29 locks. The canal then keeps upon a level to Basingstoke for the remainder of its course. In the former part of the canal the width upon the water line is 36 ft., with a depth of 4 ft. 6 in., the locks being 72 ft. long by 13 ft. wide; in the latter portion the width is 38 ft., with a depth of 5 ft. 6 in. At Aldershot is a large reservoir for supplying the canal, which is also fed in some parts of its course by the Loddon.

At Brentford the Grand Junction Canal locks into the Thames, and places the metropolis in connection with the midland coal and iron fields. It was one of the principal works of Mr. William Jessop; and its execution led to the construction of some of the most remarkable engineering works antecedent to those upon the modern railways. There are two summits upon the line, the first near Braunston Mill, which is 37 ft. above the point of junction with the Oxford Canal. The canal then runs for about 4¼ miles on a level; it then falls 60 ft. in rather more than ⅝ of a mile; it then runs on a level about 13⅜ miles; then falls 112 ft. in a length of 6½ miles. A rise of 192 ft. in 21⅛ miles succeeds, with a summit level near Tring 3¾ miles long; the fall is thence resumed towards the Thames, being 395 ft. in a length of 34¼ miles nearly, broken by a level reach 4¾ miles long. The total rise from the Oxford Canal is thus 229 ft.; the total fall towards the Thames is 567 ft., which together are overcome by 90 locks.

There are several very extensive cuttings in the line of this canal, and two very remarkable tunnels. The one upon the first summit level is in the lias, and is 2045 yds. long; that of Blisworth is 3080 yds. long, and in the blue clay. The internal width is 16 ft. 6 in.; the depth below the water line is 7 ft.; from that line to the soffit the distance is 11 ft. In the total length of the canal there are not less than eight reservoirs for the supply of water, whose united capacity is assumed to be about 260 millions of cubic ft. There are steam engines at several of them to pass the water from one to the other. Numerous branches were also made from the main line; as, for instance, to Stratford, Northampton, Buckingham, Newport Pagnell, Aylesbury, Wendover, and, lastly, from Uxbridge to Paddington. This last-named branch is 14 miles long, and level throughout, maintaining an elevation of 90 ft. above low water at Limehouse. It terminates in the very centre of the new part of the town, springing up near the Great Western Railway Station. The date of the execution of this canal was 1793; its total length is 90 miles; its cost above two millions sterling, or about 22,223*l.* per mile.

The width of the canal upon the water line is 43 ft.; at the bottom 24 ft.; the depth of water 5 ft. The length of the locks is 82 ft., the width 14 ft. 6 in., the barges generally carrying 60 tons. At Paddington the basin is 400 yds. long by 30 wide, with wharfs let to private merchants and carriers on either side.

Regent's Canal joins the Grand Junction Paddington Branch at a point near Maida Hill; and after skirting the north side of London, it falls into the Thames near the Commercial Road, where a large dock has been constructed to receive colliers. The total length is 8½ miles, and the difference of height between it and the low-water mark at Limehouse (90 ft.) is gained by 12 locks. The width upon the water line is about 48 ft.; at the bottom it is 30 ft., with a mean depth of 6 ft. The towing-paths are about 12 ft. wide, and upon the opposite bank is a footpath 3 ft. wide. All the locks have double chambers, and they receive similar barges to those used upon the Grand Junction Canal.

At a short distance from the junction with the latter, the Regent's Canal passes under Maida Hill by a tunnel 370 yds. long. At Islington there is another tunnel under White Conduit Street 900 yds. long. Several short branches, forming in fact so many basins, are also constructed in the length. Thus there is one on the east side of the Regent's Park, near Cumberland Market; another near the Great Northern Railway Terminus; a third near the City Road; a fourth called the Wenlock Basin, a little to the east of the last. The tidal dock near the Commercial Road was originally 10 chains long by 6 chains wide; but, as new works are in progress for its aggrandisement, these dimensions must only be considered approximate.

The advantages of water communication with the river were so much appreciated some years since, that several other short canals or basins were formed from it upon the north and upon the south shore. Thus, the Kensington Canal was made from the Thames a little on the west of Battersea Bridge, terminating near the Hammersmith Road. The Grosvenor Basin, from near the Chelsea Hospital to the Commercial Road, Pimlico, enables barges to enter the heart of that rising district of our enormous metropolis.

On the southern shore of the Thames, in its course through London, the Surrey Canal, which formerly served as the terminus to the Croydon Canal, may be said to be the counterpart to the Regent's Canal on the north. It commences at a point nearly opposite the eastern entrance of the London Docks; and after forming a large basin able to accommodate 300 ships, round which are immense stores and granaries able to hold 4000 tons of grain, it follows nearly the line of the canal cut by Canute, the Dane, for the purpose of transporting his vessels into the upper part of the river, past the defences of old London Bridge and the South-work. The Surrey Canal runs as far as the Camberwell Road, and has a branch towards Peckham. It would be very easy to convert the Mill-pond to some such useful purpose.

The last canal in the district we are examining is that formed for the regulation of the river Lea. The navigation of the river itself is about 26 miles in length, from Hertford to the outfall in the Thames, with a series of locks to overcome the fall from the former place, where the Lea is 111 ft. 3 in. above the level of the sea. The barges are limited to 40 tons burthen by an Act of Parliament, dated 1805. The Stort and Lea are connected above Hertford by a canal 5 miles long. We have already mentioned the canal called Sir George Ducket's Canal, and the Lea Cut, which were made for the purpose of facilitating the intercommunication between the upper portion of the Lea and the Thames.

Some years since the city of London sold a canal they possessed across the Isle of Dogs to the West India Dock Company; it now forms a portion of that splendid establishment, and is principally used as a timber dock.

With the exception of the tunnels upon the Grand Junction line, and the ship basins of the Regent's and Surrey Canals, there are few works upon these lines which may be considered worthy of notice. Indeed, the only merit they possess lies in the choice of the directions they follow, although some of them, especially the Basingstoke, would well justify considerable outlay to secure a better line. The bridges are usually very mean, contemptible structures on most of our canals near London: the towing-paths are badly kept; the lock-gates are clumsy and ill-maintained; the beds of the waterway, as in all old canals, are entirely formed by the awkward and expensive process of puddling. The commercial movement is, however, very astounding, and a visit to the establishments of some of the large carriers would be a source of great interest and instruction. Perhaps the Regent's Canal basin and Messrs. Pickford's wharf at the City Road basin, may be considered the most worthy subjects for examination.

Foreign engineers are invariably much astonished to find that nearly all our canals are constructed of different dimensions, so that boats which suit one cannot pass upon another. It is very much to be regretted that such should be the case; but as we have no central administration of public works, this inconvenience was almost inevitable. Our consolation must be that, owing to the uncontrolled liberty of action thus left to capitalists, we have been long in possession of a system of navigation so perfect that we may almost assert that no place of note in England is at more than ten miles distance from water carriage.

The tolls authorized to be raised by Acts of Parliament are rarely enforced; the opposition of the railways, in fact, is so great, that the canals have been obliged to lower their tolls lately, and as the working of railways becomes more and more economical, they must be lowered still more to retain the present traffic.

CEMETERY COMPANIES.

From an early period it was the practice in London to bury without the abodes of the living. The Romans and Britons had their graveyards in Goodman's Fields and Spitalfields. When our fathers took London from the latter people, they formed a small village on the ruins, and buried at Aldermanbury, Lothingbury, and Bucklersbury. In the middle ages, the mischievous plan of burying in the churches was largely followed, and so it has been until, in 1850, this was partially forbidden by Act of Parliament. In the 17th century, the city of London opened a graveyard in the Bunhill Fields; and large parishes, as St. George's, St. James's, and St. Martin's, have likewise opened graveyards in the outskirts; but London has grown beyond what could have been foreseen, and these intended extramural cemeteries have become intramural nuisances. Within the last twenty years the wish for extramural cemeteries, fostered by the example of Père la Chaise, has become very strong, and such establishments have been formed in the neighbourhood of London, and now have the countenance of royalty.

The General Cemetery Company was that first formed in 1832, and has an establishment at Kensal Green, in the western suburbs. Here are buried H.R.H. the Duke of Sussex, H.R.H. the Princess Sophia; and there is a vault purchased by the Queen. The tombs of Andrew Ducrow, the equestrian, and George Robins, the auctioneer, are among the largest and most showy. There are likewise buried the Rev. Sydney Smith, Thomas Barnes, editor of the *Times* for many years till 1841, Thomas Hood, Allan Cunningham, J. C. Loudon, George Dyer, the historian of Cambridge, Dr. Birkbeck, the promoter of mechanics' institutions, Sir A. Calcott, R.A., T. Daniell, R.A., Sir W. Beatty (Nelson's surgeon), Sir Anthony Carlisle (Surgeon), Dr. Valpy, John Murray, the publisher, Anne Scott, and Sophia Lockhart, daughters of Sir Walter Scott and John Hugh Lockhart, his grandson, the "Hugh Littlejohn" of the "Tales of a Grandfather," Liston, the actor. There are likewise tombs of Dwarkanauth Tagore, a Calcutta baboo, Sir Edward Hyde East, an Indian Judge, the Baroness Feucheres, Right Hon. Joseph Planta, Right Hon. Sir George Murray, Sir John Sinclair, Lord Granville Somerset, Chief Justice Tindall, Right Hon. P. H. Abbot, Charles Buller, M.P. Of Admirals and Generals, Sir Chas. Rowley, Sir William Anson, Hon. Mr. Bathurst, Sir A. Brooke, Sir James Cockburn, Sir Moore Disney, Sir R. W. Otway, Sir M. Maxwell, Sir Hector Maclean.—The Duchesses of Argyll, Leeds, and Roxburgh.—Marquisses Graham, Sligo, and Thomond.—Marchioness Headfort.—Earls of Athlone, Cavan, and Galloway.—Countesses Castle Stuart, Clare, Galloway, Kinnoul, and Westmeath.—Lords C. S. Churchill, De Ros, Fitzgerald, Garvagh, Hartland, Glentworth, Howden, Hallyburton, Langford, W. Lake, Portarlington, St. Helen's, Arthur, and Allan Stewart.—Bishops of St. David's and Quebec.—Ladies Elizabeth Armsbury, F. Anson, H. T. Ashburnham, M. C. Bentinck, C. and L. Browne, A. Baynes Baker, H. de Blaquiere, Briggs, E. Colville, Spencer Churchill, C. Campbell, S. Cumming, Coleraine, C. Capel, F. Cole, M. Cockburn, E. Dundas, M. Drummond, T. Dillon, De Clifford, C. M. Dallas, East, E. Elliott, Fitzroy, H. Fitzgerald, M. Gardiner, A. Garrett, Ann F. and E. D. Hamilton, Hughan, G. M. A. Hope, Juliana Howard, A. Treby, Jane Lyon, M. Lamb, Louisa and A. C. Murray, C. Morrison, E. Monck, H. Pringle, A. Palmer, M. M. Pasley, Rossmore, Helen Stewart, J. Stanley, Stuart, J. Tuite.—Sirs H. Bell, G. M. Cox, C. Colville, T. Corsellis, Herbert Compton, W. Douglass, H. Duncan, W. Erskine, Francis and G. H. Freeling, R. C. Ferguson, T. Fuller, G. Farrant, T. Gambier, James Leighton, J. Hamilton, J. Hawker, G. W. Lefevre, R. Macfarlane, H. W. Martin, Wm. Murray, D. Macleod, Arthur Pigott, N. L. Peacock, M. W. Ridley, T. B. St. George, E. Stanley, T. A. Wright, H. V. Webster, Marchese Brancaleone.—Counts de Pollon, De Lusi, Reventlow, Von Schuylenburg.—Countess Batthyany, De Valmer, De Dourville, De Charlespont, De Wints.—Baroness De Katzleben.—Honourables F. Bowles, Elizabeth A. Buchanan, Pierce Butler, Charles Cholmondeley, W. N. R. Colborne, Robert Claxton, Anne Dunning, W. Fraser, Margaret Fraser, A. G. Hood, Blanche Howard, Miss Charlotte Irby, Caroline C. Kennedy, John Kennedy, Katherine King, F. Leslie, D. Macdonald, Thos. H. Nugent, J. Steward, Chas. Stuart, James Stuart (85th Light Infantry), Mary Tollemache, John Tollemache, Arthur C. Tollemache.

The Cemetery of the West London and Westminster Cemetry Company is in Fulham Road, Brompton, and has little variety of surface. Here is a conspicuous marble tomb with a lion couchant to Jackson, a pugilist.

The London Cemetery Company have cemeteries at Highgate to the north, and Nunhead to the south, each in a most picturesque situation, and commanding a fine view of the giant city, lying below.

Abney Park Cemetery is at Stoke Newington, and has entrances from Stoke Newington Road, and from the high road to Edmonton. It has some fine trees. A statue of Dr. Isaac Watts, by Bailey, R.A., is in memory of his residence in the house now included in the cemetery, and after which it is named.

The City of London and Tower Hamlets Company has a cemetery at South Grove, Mile End.

Another cemetery in the eastern suburbs is that of the East London Company, White-horse Lane, Stepney.

The South Metropolitan Company has a cemetery at Norwood, in a most picturesque situation on the southern range of hills.

Bunhill Fields burying ground, in the City Road, was opened as a suburban cemetery in 1665, in the time of the great plague, and was a favourite burying place with the dissenters. There is no tomb of artistic pretension. Here are buried Daniel Defoe, author of "Robinson Crusoe;" John Bunyan, the author of the "Pilgrim's Progress;" Dr. Isaac Watts; Joseph Ritson, the antiquary; Dr. Thomas Goodwin, the chaplain who attended Cromwell's death-bed; George Fox, the founder of the Quakers; the mother of John Wesley; Lieut.-Gen. Fleetwood, a son-in-law of Cromwell; Thomas Hardy, tried for sedition in 1794; Thomas Stothard, R.A.; William Blake, the painter; Dr. Daniel Williams, founder of the Public Library in Redcross Street; John Dunton; George Whitehead, a Welsh bard; and other minor literary men.

In the burial ground of the Wesleyan Chapel opposite are buried John Wesley and other authors of Methodism.

The churches and churchyards which contain the most interesting tombs are Westminster Abbey (poets, statesmen, and generals), St. Paul's (artists and admirals), St. Saviour's, Southwark, St. Giles's, Cripplegate (literary), St. Paul's, Covent Garden(actors), the Temple (literary), Marylebone, St. Pancras, Paddington, Lambeth (ecclesiastical), St. Bartholomew's, Smithfield, Stepney, Chelsea, Battersea, St. Helen's, Bishopsgate, St. Margaret's, Westminster, St. James's, Westminster, and St. Martin's-in-the-Fields.

THE CHARITIES OF LONDON.

Notwithstanding our remarks in pages 263, 264, it is gratifying to observe, that amidst all our luxuries of life, the ways and means for enjoying the "luxury of doing good" is advancing. London, for this, as for most other purposes, forms the grand focus from which the great machinery of charitable usefulness emanates; and it is no slight test of the spirit pervading our country, and a cause almost we might say for national congratulation, that in the face of heavy taxation and poor-rates, there are in and near the metropolis no less than 491 charitable institutions, exclusive of charity schools, and mere local and district funds. These institutions are supported at an annual cost of 1,764,733*l.*, of which amount 746,869*l.* arises from secured sources, and 1,023,864*l.* is derived from present voluntary contributions. This bare fact appears eminently calculated to excite a corresponding feeling of thankfulness and contentment amongst the poorer classes, and we would, for this, as well as for other reasons, that the little volume from whence we gather the information * should find an extensive circulation. We believe that in the hands of the benevolent, wealthy, or actively charitable, it would be found invaluable. To the former it serves to point out a system of almsgiving, and to the latter a means of as great usefulness, by imparting the requisite information whereby the benefits of each charity may be obtained for the objects of their solicitude; and beyond this, it will, it is hoped, form a successful advocate of many a needy but deserving charity, and serve to develope at once what remains, or is still required, to be done. The following appears the summary of the 491 *metropolitan charities* referred to, each of which is treated of in detail: 12 *general medical hospitals*, making up beds to the number of 3326, relieving a total number of patients in 1849 (out and in patients) 329,608; 50 *special medical charities* (including hospitals and infirmaries for consumption, asthma, fever, distortions, &c. &c.), granting relief last year to 105,997 patients, and 35 *general dispensaries*, affording relief during the same time to 140,869 persons. Besides these medical charities, there are the following societies and establishments:—12 *for the preservation of hope* and public morals; 18 *for reclaiming* and reforming the fallen; 14 *for relief of general wants and distress;* 12 *for relief of specific distress;* 14 *for aiding* the resources of the industrious; 11 *for the blind, deaf, and dumb;* about 150 *colleges, asylums, and almshouse* institutions for the aged; 40 *societies for church and school extension*, clerical and Christian visiting; 35 *Bible and Missionary* Societies, &c. Of these 500 and more institutions, it is peculiarly interesting to observe the dates of origin; thus about 300 appear to have been established or commenced during the last fifty years; 109 during last century, and as many as 88 remaining of the 16th and 17th centuries. See pages 64—68.

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* "The Charities of London, their Orgin and Design, Progress, and present Position, by Sampson Low, Junior," London. See also pages 240, 246 of this work.

CLUB-HOUSES.

As at present constituted, the London clubs and club life have produced a new phase in English society, at least in the metropolis—one that will claim the notice of some future Macaulay, as showing the very "form and pressure of the time;" while to the more patient chronicler of anecdotes, club-house traditions and reminiscences will afford materials all the more interesting, perhaps, for not being encumbered with the dignity of formal history. Our task is merely to touch upon and attempt a slight characteristic outline of them; not to trace the history of clubs to their origin in the heroic ages of Greece. We shall not go back even to the clubs of the last century, except just to indicate cursorily some of the *special differences* between them and those of the present day.

Until about thirty years ago a club was seldom more than a mere knot of acquaintances who met together of an evening, at stated times, in a room engaged for that purpose at some tavern, and some of them held their meetings at considerable intervals apart. Most of them were anything but fashionable—some of them upon a footing not at all higher than that of a club of mechanics. Among the regulations of the Essex Street Club, for instance (instituted by Dr. Johnson shortly before his death, and which was limited to twenty-four members), one was, that each person should spend not less than *sixpence;* another, that each absentee should forfeit *threepence,* and each of the company was to contribute a *penny* as a *douceur* to the waiter! At that period the chief object of such associations was relaxation after the business of the day, and the enjoyment of a social evening in a homely way in what would now be called a snug party. The celebrated "Literary Club," which was founded by Reynolds in 1763, and whose meetings were held once a week at the Turk's Head, in Gerrard Street, Soho, now a very unfashionable locality, consisted at first of only nine members, which number was, however, gradually increased to the large number of *thirty-five;* yet, limited as it was, it would not be easy even now to bring together as large a number of equally distinguished characters. That club dined together once a fortnight, on which occasions "the feast of reason and the flow of soul" were, no doubt, enjoyed in perfection. In most clubs of that period, on the contrary, the flow of wine, or other liquor, was far more abundant than that of mind, and the conversation was generally more easy and hilarious than intellectual or refined. The bottle, or else the punch-bowl, played too prominent a part; and sociality too frequently partook of bacchanalian festivity, if not revelry, at least, of what would now be considered such according to our more temperate habits;—and it deserves to be remarked that, though in general the elder clubs encouraged compotation and habits of free indulgence as indispensable to good-fellowship and sociality, the modern clubs, on the contrary, have done much to discourage them as low and ungentlemanly. "Reeling home from a club" used to be formerly a common expression; whereas now inebriety, or the symptom of it, in a club-house, would bring down disgrace upon him who should be guilty of such an indiscretion.

The old clubs have passed away, for though some of them, or similar societies, may still exist, it is behind the scenes, instead of figuring conspicuously upon the stage. Quite a new order of things has come up, *the* clubs of the present time being upon quite a different footing, and also, comparatively, gigantic in scale. From small social meetings held periodically, they have become permanent establishments, luxurious in all their appointments; and of some of them the *locales* are quite palatial. No longer limited to a few acquaintances familiarly known to each other, they count their members by hundreds, and, sleeping accommodation excepted, provide for them abundantly all the *agrêmens* of an aristocratic home and admirably-regulated *ménage,* without any of the trouble inseparable from a private household, unless it be one whose management is, as in a club-house, confided to responsible superintendents. In fact, a modern London club is a realization of a Utopian *cœnobium*—a sort of lay convent rivalling the celebrated Abbey of Thelemé, with its agreeable rule of "*Fais ce que voudras,*" instead of monastic discipline and mortification. Even a Sybarite might be content with the studied and refined comfort which pervades every department of a West End club-house, and which is such as to be unattainable in a private family, except by the opulent, though here brought within the reach of those whose means are comparatively moderate.

Besides those staple features, news-room and coffee-room, the usual accommodation of a club-house comprises library and writing-room, evening or drawing-room, and card-room, billiard and smoking-rooms, and even baths and dressing-rooms; also a "house-dining-room," committee-room, and other apartments; all appropriately fitted up according to their respective purposes, and supplied with almost every imaginable convenience. In addition to the provision thus amply made for both intellectual and other recreation, there is another important and tasteful department of the establishment; which with many, perhaps, stands foremost among the attractions of a club-house—namely, the *Cuisine;* nor is its auxiliary, the cellar, to be overlooked. The first-mentioned of these is presided over by a *chef,* sometimes one, like Soyer, whose fame is widely spread among the adepts in gastronomy, as an accomplished *artiste*—a professor whose performances do not fall short of his professions, but who shows himself skilled in the most recondite mysteries of culinary philosophy and science, and to be worthy of a niche in the "*Classiques de la Table,*" or of honourable mention by some future Anthus, in a series of ticklingly piquant "*Vorlesungen über Esskunst.*"* Although it does not bear those words inscribed upon it, the *carte* seems to say FARE WELL, not as a phrase of dismissal, but of welcome and invitation, its contents being such as to adapt themselves to the humour of every palate, since they range from roast beef and other joints *au naturel* to the most *recherché* sophistications of edible substances. Besides, the more material advantages, the completeness of the attendance, the admirable good management, and the style in which everything is conducted, ought to be taken into account; and what not least of all recommends a club-house to those who have no establishment of their own, is the economy of the system. To live upon the same scale and footing, to be surrounded with the same atmosphere of luxuriousness and refinement elsewhere, at anything like the same cost, is utterly impracticable. The moral influence of club life is also, upon the whole, a favourable one; if there be no longer that heartiness of sociality which characterized the clubs of the last century, when their meetings did not exceed in number that of a private party of friends, there is more of the polish of gentlemanly manners and decorum, and infinitely less of intemperance, or rather intemperance is banished altogether as a low and disgraceful vice, and what, if openly indulged in so as to exhibit its effects, would disqualify for companionship, and lead to loss of caste. Great is the improvement which has taken place in our English habits in this respect; and it is one which has partly, if not mainly, been brought about by modern club habits—after-dinner compotations and evening symposia being quite out of the question. In fact, club-house statistics would warrant our concluding that, instead of aught approaching excess, abstemiousness is the general rule, the average charge a head for wine and liqueurs being under two shillings per diem—a most monstrous falling-off from the days of six-bottle heroes in the annals of bacchanalian achievement; although the degeneracy from such heroism may fairly be considered an advancement in civilization.

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* Apropos to kitchen matters, Anthus himself has recorded the sausage-making achievements of Leo X., though whether the flesh of papal *bulls* formed any of the ingredients is not specified. "The gentle Elia," too, has given us a most amusing account of the "Origin of Roast Pig;" but no one has yet pretended to discover that of pickled onions. Yet the inventor of them was obviously no less a personage than Queen Cleopatra herself, who was the first that steeped a *unionem* or *onionem* in vinegar. Now that it is here pointed out, the matter is as clear as midnight—and that there are bright moonshiny midnights, as well as dark ones, the most captious cannot deny. Apropos, again, to the diners at club-houses, if we are to believe the late Lady Blessington, many a wealthy old bachelor is compelled to starve at home upon spunge-cake and a bottle of Madeira—a substitute for a dinner—when he is prevented from going to his club: it being impossible, it would seem, in such a place as London, even for those who can afford to pay for it, to procure a dinner from a tavern.

For those who avail themselves of it, the refectory part of the club-house system recommends itself by extraordinary cheapness in comparison with the superior quality of the viands; which cheapness, marvellous as it may appear, is at once accounted for by the fact that whatever is consumed in the way of eating and drinking, is charged to the actual consumers at only cost price, and is further supplied in large quantities by the best purveyors. All other expenses, such as rent, rates and taxes, salaries, servants' wages, &c., fall upon the club or general body, and are defrayed out of the fund arising from entrance fees and the annual subscriptions; both which last vary, they being in some clubs considerably higher than in others, according to the style and status affected for the institution. The advantages held out by clubs of this description are such that they would be abused were it not for one wholesome regulation, and, indeed, quite indispensable precaution, which is, that no one can be admitted as a member unless he be first proposed by some actual member, who thereby becomes responsible for his pretensions and eligibility; nor is even that sufficient, for the candidate must afterwards undergo the ordeal of the ballot-box. Another precaution is, that each member must leave with the secretary his *bonâ fide* address, or place of residence for the time being. Thus a club is tolerably well fenced in from those "loose fish" of society, who might else, by clever manœuvring, contrive to get out of their own proper element into that higher one, where, after all, perhaps, they might chance to find themselves pretty much in the condition of fish out of water.

As to the management of a club household, nothing of the kind can be more complete or more economical, because all its details are conducted quite systematically, consequently without the slightest confusion or bustle. The whole may be compared to a skilfully-contrived piece of machinery, regularly wound up and kept in order. Every one has his proper post and definite duties, and what contributes to his discharging them as he ought is, that he has no time to be idle; wherefore many a private establishment might take an excellent lesson from that of a club-house. The following is the scheme of government adopted:—At the head of affairs is the Committee of Management, who are appointed from among the members, and hold office for a certain time, during which they constitute a board of control, from whom all orders emanate, and to whom all complaints are made, and irregularities reported. They superintend all matters of expenditure and the accounts, which last are duly audited every year by others, who officiate as auditors. The committee further appoint the several officers and servants, also the several trades-people. The full complement of a club-house establishment consists of secretary and librarian, steward and housekeeper; to these principal officials succeed hall-porter, groom of the chambers, butler, under-butler; then in the kitchen department, clerk of the kitchen, *chef*, cooks, kitchen-maids, &c.; lastly, attendants, or footmen, and female servants, of both which classes the number is greater or less, according to the scale of the household.

The regularity which pervades the domestic economy generally, is particularly remarkable in the kitchen department; for instead of anything like bustle, or that *fuss* which notable housewives seem to think essential to good management, all the culinary operations, multifarious as they are, are conducted with activity and despatch, at the same time in the most orderly and methodical manner, towards which the arrangements of the place contribute not a little. In the Reform, and some of the other large club-houses, the kitchen, with its manifold apparatus, machinery, and *modi operandi*, constitutes a perfect laboratory for scientific preparations of the most appetite-enticing kind. In fact, the greatly-improved apparatus, appliances, and contrivances here adopted, render this part of a club-house well worth the study of the practical architect, more especially as scarcely any information whatever respecting kitchens, and other domestic offices, is to be obtained from books even professedly on the subject of domestic architecture. Besides the kitchen itself, properly so called, there are various dependencies belonging to it, for stores of the *ammunition du bouche*—special larders and pantries for every kind of *materiel*, viz., not only for meat generally, but for cold meat, game, fish, vegetables, confectionary, separately. That there are various store-rooms and cellars hardly needs to be said; and in addition to them, there are one or more servants' halls, a clerk of the kitchen's room, butler's do., together with others for the principal domestics. Hence the basement of a club-house requires quite as much or more study and contrivance than any other part of the plan; and in order to double the space to which it would else be confined, it is usually sunk to a very great depth, so as to obtain an additional floor within it, that is, an entresol between the lowermost or kitchen floor and the apparent external ground-floor. This economy of plan—which may be said to be peculiarly English—provides a complete habitation for the domestic and official part of the establishment, and an invisible one also, provided it be properly screened out by dwarf parapet walls or balustrading, to prevent the area being overlooked, as is done at the Travellers' and Reform, where such inclosure below enhances not a little the general effect of the elevation by producing a suitable architectural base, and substituting the ornamental for the unsightly. In those club-houses which have baths, they, and the dressing-rooms annexed to them, are placed in the entresol.

On the ground-floor the principal hall is sometimes entered immediately from the street; in other instances it is preceded by an outer vestibule of smaller dimensions and far more simple architectural character, which disposition is by far the better of the two, inasmuch as it produces greater extent of approach, secures greater privacy and protection from draughts of air to the inner hall and the rooms opening into it, and also keeps in reserve what may be called the focus of architectural effect. At a desk near the entrance is stationed the hall-porter, whose office it is to receive and keep an account of all messages, cards, letters, &c., and to take charge of the box into which the members put letters to be delivered to the postman; his function is therefore one that requires unremitting punctuality and attention. The two chief apartments on this floor are the morning-room and coffee-room *, the first of which is the place of general rendezvous in the early part of the day, and for reading the newspapers. They are, of course, very spacious apartments, but of comparatively sober character—though for the new "Carlton" coffee-room a high degree of ornateness has been studied. The only other public room on this floor is the House-Dining room, yet it can hardly be reckoned among them, at least not among the "show" rooms, it being, it would seem, etiquette that it should be of extreme plainness, however lavishly other parts of the interior may be decorated. With regard to its particular denomination and purpose, it may be proper here to explain that, although the *habitués* of the club take their meals in the coffee-room, some of the members occasionally—perhaps about once a month, make up a set dinner party, for which they previously put down their names, the day and number of guests being fixed; and such social *quasi*-private reunions around the "mahogany," which may be termed reminiscences of the clubs of other times, are in club parlance styled *house-dinners*. Another room—which, however, is wanting in some club-houses—is an ante-room or waiting-room, where a stranger can have an interview with a member.

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* In some of the club-houses there is also what is called the "Strangers' Coffee-room," into which members can introduce their friends as occasional visitors.

Ascending to the upper or principal floor, we there find the evening or drawing-room, and card-room, the library, and writing-room; the first-mentioned of which is made the superlative degree, if not always of architectural effect, of the embellishment aimed at. With regard to the card-room, *Honi soit qui mal y pense!*—gambling and games of chance are interdicted; not even so much as what Lady Townley calls "poor, piddling, five-guinea whist" is permitted; therefore, if any gamblers there be, they must either do penance at their club, or seek refuge in some less scrupulous and strait-laced society*. For many, no doubt, the intellectual refectory or library possesses as strong attractions as any other feature, since it supplies them with all the journalism and the cream of the literature of the day. The writing-room is also a very great accommodation, for many gentlemen write their letters at, and date from, their club. Upon this floor is generally the committee-room, and likewise the secretary's room. The next or uppermost floor, which, however, does not show itself externally, it being concealed within the roof, is appropriated partly to the billiard and smoking-rooms, and partly to servants' dormitories, which divisions are kept distinct from each other. Being quite apart from the other public rooms, those for billiards, &c., make no pretensions as to appearance, neither is commodiousness of approach to them always so well studied as it ought to be, the staircase leading to them generally contrasting very strangely and disagreeably with the "grand staircase" below, so that, after all, another room remains, namely, *room* for further improvement in club-house architecture. There is opportunity, too, for doing more than has yet been attempted, were it only by throwing greater variety and architectural effect into the plans themselves, and by occasionally adopting circular, octagonal, and other polygonal forms, and combinations of them, for the rooms; whereas at present we find only rectangular ones, without other variety or distinguishing effect than what can be produced by mere wall decoration, upholstery, and furniture. There is, moreover, one elegant luxury which, as we have seen remarked, has not yet been thought of for a club-house, to wit, a conservatory or covered garden, a more agreeable lounging-place than which, provided it were suitably adapted to such purpose, could hardly be devised.

Having explained the present club system, and the usual arrangements of a club-house, we shall now speak of the external character of buildings of the kind, as features formerly quite unknown in our street architecture. Upon Pall Mall and its immediate vicinity—the former more especially—they have bestowed a certain nobleness of physiognomy, of which no other part of the town affords an example, they being marked by a certain unmistakeable quality as well as character, both of which combined distinguish them from all our other buildings, whether public or private. They may be said to be the only structures in the British capital that answer to the palazzi of Italian cities, the town residences of even the wealthiest of our nobility being, with here and there an exception, of the most unpretending, not to say homely, appearance; and those exceptions become fewer still, if we confine them to such as not only show themselves to be aristocratic mansions, but also exhibit something of the grandiose also in their style and design; such, for instance, as Spencer House, and Bridgewate House, to which might be added Burlington House, were it not unfortunatel

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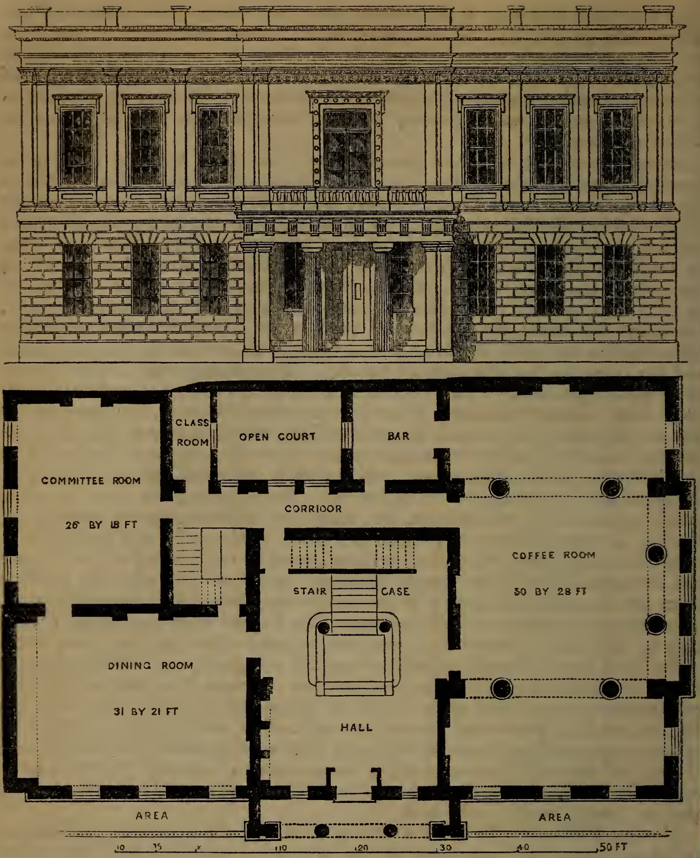
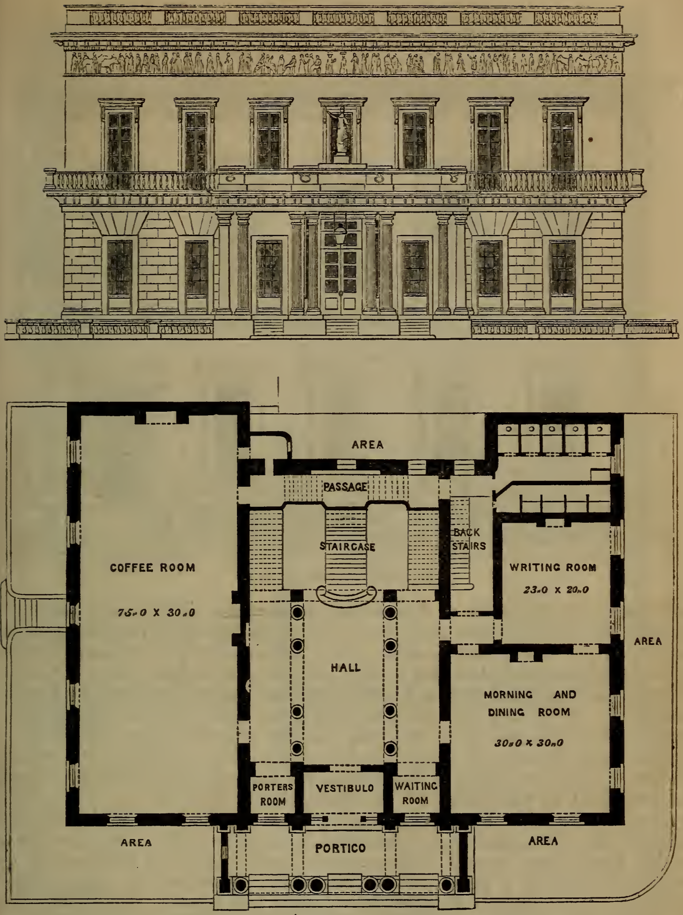
* What with half pints of wine after dinner, and half-guinea whist at the card table, it must be confessed that the present age has so greatly degenerated that "*Fuimus Troes*" ought to be its motto.


CLASS ROOM
OPEN COURT
BAR
COMMITTEE ROOM
26 BY 18 FT
CORRIDOR
COFFEE ROOM
50 BY 28 FT
STAIR
CASE
DINING ROOM
31 BY 21 FT
HALL
AREA
AREA
10
5
10
20
30
40
50 FT

UNIVERSITY CLUB-HOUSE, ELEVATION AND PLAN.

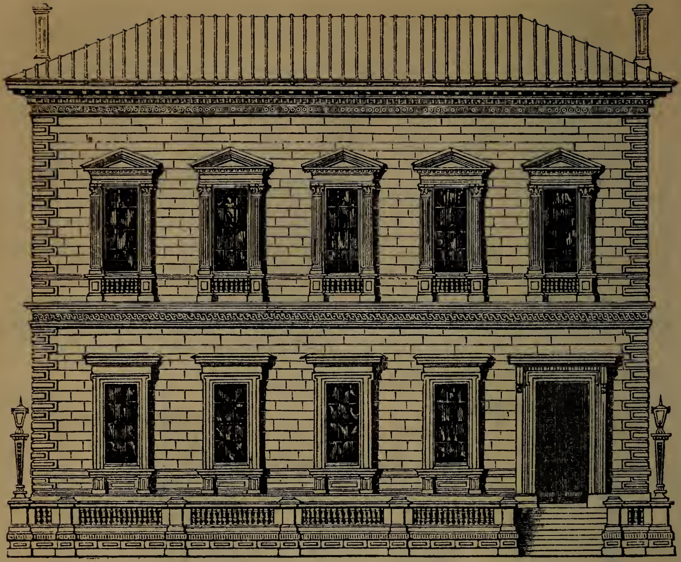
shut out from view, therefore, perforce, ignored by the public. Even of th club-houses themselves the earlier erected ones do not evince much study o design, or exhibit anything striking, unless it be the "University," in Pall Mall East (first opened in 1826), the number of members of which is limite to 1000; 26*l.* 5*s.* entrance fee; 6*l.* annual subscription. The "Union," limite to 1000 members, entrance 32*l.* 10*s.*, annual subscription, 6*l.* 6*s.*; and th "United Service," limited to 1500 members, entrance 30*l.*, and 6*l.* annually which are about the same date, namely, 1827 and 1828, bear upon them th mark of their respective architects, Sir Robert Smirke and John Nash. Th Athenæum, by Mr. Decimus Burton (the next club-house in point of date, i being opened in November, 1830), showed considerable progress with regard t ornateness and finish, for it presented the then somewhat extravagant novelt of a sculptured frieze; the only other instance, at that time, was the one o the portico of the India House. The richness so given to the upper part o the Athenæum is, however, attended by one bad effect, since it causes th


AREA
PASSAGE
STAIRCASE
BACK STAIRS
COFFEE ROOM
75.0 X 30.0
WRITING ROOM
23.0 X 20.0
AREA
HALL
MORNING AND DINING ROOM
30.0 X 30.0
PORTERS ROOM
VESTIBULO
WAITING ROOM
AREA
PORTICO
AREA

ATHENÆUM CLUB-HOUSE, ELEVATION AND PLAN.

cornice of the corresponding mass of building on the east side of Carlton Place, (the United Service), to appear still more insignificant and mean than it else would do—a circumstance that seems to be either unperceived or ignored, or else that club would no doubt have deemed it worth while to bestow a nobler cornice upon their building; and another easy improvement would be to enlarge one of their ground-floor rooms by throwing out a bay to correspond in general appearance with the opposite entrance porch of the Athenæum. The number of members of this club is limited to 1200; 26*l.* 5*s.* entrance fee, and 6*l.* 6*s.* annually.

After the Athenæum, the next in succession, as in date (1831), is the Travellers', a structure that fairly makes an epoch in the architectural history of club-houses, as being almost the first, if not the very first, attempt to introduce into



TRAVELLERS' CLUB-HOUSE.

this country that species of rich *astylar* composition which has obtained the name of the Italian *palazzo* mode, by way of contradistinction from Palladianism and its orders. Grecianism, Nashism, and Smirkeism had been exhausted, when, in an auspicious hour, both for himself and for architectural design, Charles Barry seized upon a style that had all along been quite overlooked by English architects. What had till then been kept out of sight from the general public was hailed, not only as a welcome novelty after the previous season of architectural dulness and insipidity, but received as originality also, though, in fact, there is very little of the latter in the façade towards Pall Mall, far less, indeed, than in the design of the garden-front, which is not only greatly superior to the other, but shows a happiness of invention which the architect has certainly not surpassed, if approached, in his later works. That production of Mr. Barry's may be said to have given a fresh impulse to architectural design, and one in a more artistic direction. It almost at once brought the style then adopted by him into vogue; not, indeed, exactly for club-houses—perhaps, because so applied, it would look too much like the direct imitation of a successful and too well-known model—but for various other buildings, in the provinces as well as in the metropolis; and its influence has likewise manifested itself in some of our recent street architecture, although *longo intervallo* in regard to taste. The "Travellers'" has, moreover, obtained a distinction which has not fallen to the lot of any other contemporary structure, it having been the subject of an elegant volume of architectural illustrations (published by Mr. Weale*); a circumstance that has, perhaps, contributed to diffuse an acquaintance with the genius and resources of that so-called *Italian-palazzo* style, all the chief features and details of that club-house being there shown at large. A similar office has not been per-

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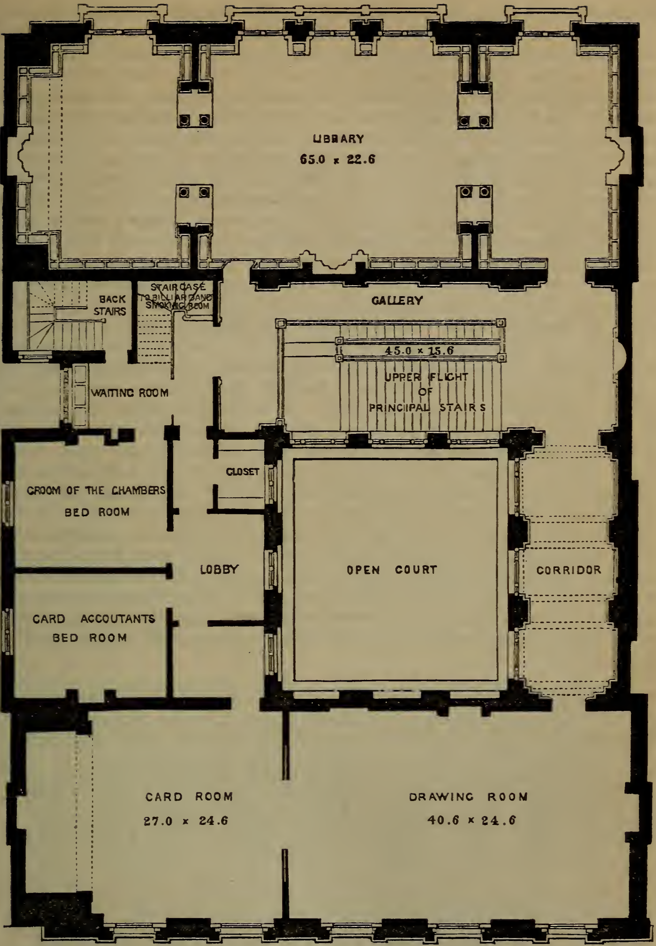
* About 1000 members. For a list of names, see Weale's publication. Entrance fee, 21*l.*; subscription annually, 10*l.* 10*s.*


LIBRARY
65.0 x 22.6
BACK STAIRS
STAIRCASE TO BILLIARD AND SMOKING ROOM
GALLERY
45.0 x 15.6
UPPER FLIGHT OF PRINCIPAL STAIRS
WAITING ROOM
CLOSET
GROOM OF THE CHAMBERS BED ROOM
LOBBY
OPEN COURT
CORRIDOR
CARD ACCOUTANTS BED ROOM
CARD ROOM
27.0 x 24.6
DRAWING ROOM
40.6 x 24.6

PLAN OF TRAVELLERS' CLUB-HOUSE.

formed for any other edifice of the same class, notwithstanding that some of them are more ambitious in their architecture and their internal decorations; yet, surely it would be a very trifling matter for a Club to publish the *plans*, &c. of their building, at their own cost, even were copies intended only as presents to their friends. Stronger reasons than pecuniary—for they are slight, indeed —there may be for this not being done, and foremost among them, perhaps, is indifference*. Of the three club-houses forming the *insula* or 'block' of buildings on the west side of Carlton Place, the Reform is, though the latest, not the least, and although it does not make pretension to striking originality, it assuredly is not, as has been repeatedly said of it, a copy of the Palazzo Farnese; unless general similarity of treatment where there is similarity of subject can justly convict of direct imitation or copyism. At all events, in this case, the points of difference between the two buildings are far more numerous than those of resemblance. In one respect, too, this club-house differs from all the others, for, whereas their elevations show only a ground floor and another over it, the Reform exhibits an additional upper story, which is appropriated exclusively to sets of chambers or lodgings for such members as may engage them, which extra accommodation is quite peculiar to that club. That floor is, however, kept quite distinct from the rest of the interior, it having a separate staircase, and entrance to it from the street, placed in the break or compartment between that club-house and the Travellers'. As to the Reform Club-house being after the Palazzo Farnese, if we are to understand '*after*' chronologically, it certainly is so; but in point of design, the only resemblance between the two structures consists in both of them being astylar, with columnar-decorated fenestration, while in all other respects, the differences between them are so strong as to put likeness entirely out of the question. The blunder itself—for it can be called nothing else—would be hardly worth noticing, did it not show what inane and random stuff may be uttered with impunity, and pass uncontradicted, on the subject of architecture. The number of members is 1400; entrance fee, 26*l.* 5*s.*; annual subscription, 10*l.* 10*s.* Extra charges are made for the occupation of the dormitories or sleeping rooms.

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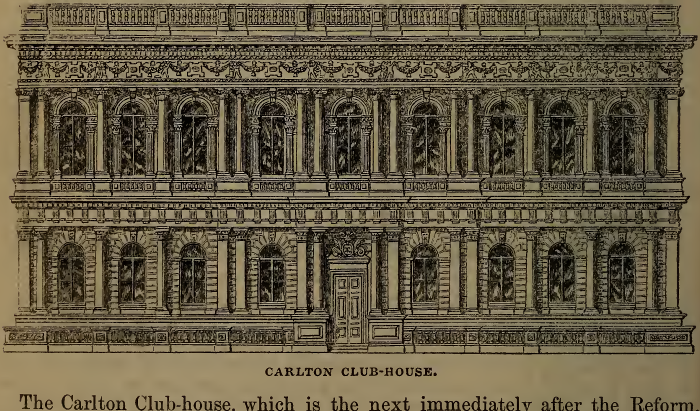
* The Travellers' had a very narrow escape from destruction on the 24th of last October (1850), when a fire broke out in the billiard-rooms, and did great damage to that part of the structure, which was, by the by, an after-thought and addition to the original building, but by no means an improvement upon the first design, for it greatly impaired the beauty of the garden-front.

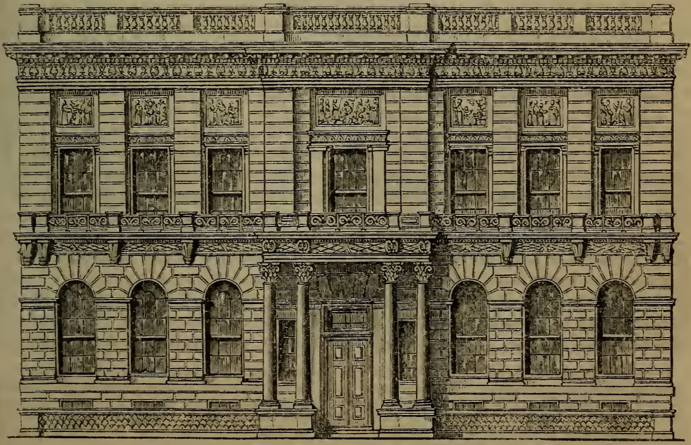
The *insula* formed by the three club-houses just spoken of, possesses a merit which ought not to be so great a distinction as unfortunately it is; it being remarkable for being treated architecturally throughout, and finished up on all its four sides; whereas, in too many instances, the effect of a front elevation is marred by design being dropped altogether for other parts, which, although not belonging to that elevation, are nevertheless offensively visible from some points of view.



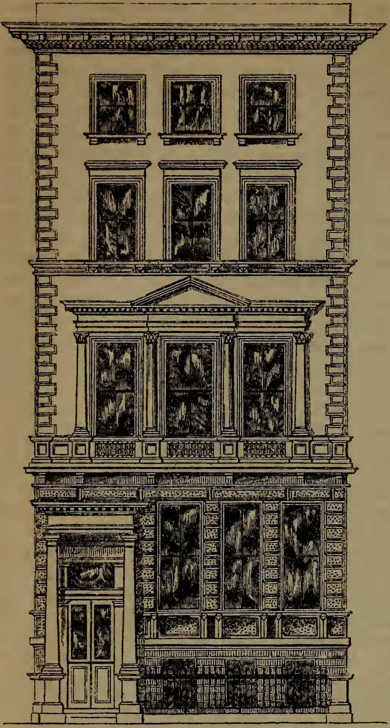
CARLTON CLUB-HOUSE.

The Carlton Club-house, which is the next immediately after the Reform, exhibits in its present state a singular architectural antithesis, the addition made to it in 1847 by Mr. Sydney Smirke, being utterly dissimilar in style and taste to the original structure erected by his brother Sir Robert. Extremes certainly meet there, for we find what may be called ultra-Italian in juxtaposition with that sort of Anglo-Greek which, after a short-lived vogue, has now fallen into discredit; a taste for the florid having now superseded that for the frigid and the bald, which last passed in its day for the classical and the chaste. The new portion is little more than a direct and undisguised copy of Sansovino's Library of St. Mark at Venice—a work whose celebrity converts into admiration the censure that this imitation of it would, were it an original composition, else incur for the monstrousness of its proportions, and violation of all orthodoxy and rule: nothing less than monstrous, in fact, can the entablature of the Ionic or upper order be pronounced, if it be tested by ordinary rules, more especially as it is considerably more ponderous than that of the Doric order below. Besides a degree of enrichment almost unprecedented in our metropolitan architecture, this addition to the Carlton Club-house exhibits a decided novelty and singularity in another respect, the shafts of all the columns being of red Peterhead granite highly polished, in consequence of which they *tell* very strongly, perhaps rather too much so, for as the same colour is not extended to any other part, they appear to be too much detached from all the rest, and instead of their being relieved by shadow or by a darker ground, the reverse of such effect takes place. At present, however, we behold only a mere specimen of what is intended ultimately to become a façade upwards of 130 feet in length, with nine windows on a floor, and which will therefore form an imposing mass, in all but immediate juxtaposition with the group of club-houses between it and Carlton Place. (We have, however, made an elevation of the building, as it will be when complete, that our readers may justly criticise it as an entire design.) Whenever it shall be so completed, the granite columns will probably help to render the extent of frontage more noticeable than it would otherwise be, whereas at present, by attracting the eye strongly to it, they cause, what is already built to strike it as being a mere narrow upright bit in comparison with some of the other club-house façades. The completion of the façade will not, we hope, be deferred. The whole of the lower floor of the part recently erected, is occupied by the coffee-room, which extends the full depth of the building, from north to south; is 92 feet in that direction, by 37 in width, 21½ high; and is divided by screens of Corinthian columns of green scagliola, into three compartments, each of the two end ones being lighted by three windows, and the central one by a glazed dome. There are 800 members; entrance fee, 15*l.* 15*s.*; annual subscription, 10*l.* 10*s.*

At no great distance from the preceding is the Oxford and Cambridge Uni-



OXFORD AND CAMBRIDGE UNIVERSITY CLUB-HOUSE.



THE GUARDS' CLUB-HOUSE.

versity Club-house, said to be the joint production of the two Smirkes; and, indeed, the design betrays some conflict of opposite tastes. For the interior, economy seems to have been chiefly consulted; and appearance has been, somewhat unpardonably, altogether disregarded for its south side, although it should have been attended to there—because it is seen from the court-yard of Marlborough House. The number of members limited to 1170; entrance payment, 26*l.* 5*s.*; annual, 6*l.* 6*s.*

The new Guards' Club-house (erected in 1848, Henry Harrison, Esq., Architect), is remarkable for its compactness and convenience, although its size and external appearance indicate no more than a private house. Not so the Army and Navy Club-house, on the opposite and sunny side of Pall Mall*, for it makes a very ambitious display, apparently out of rivalry to the Carlton. In like manner as for that building, here also a design of Sansovino's has been made use of, though with considerable deviations from the original, little more of it, in fact, being retained than that of the lower part or basement, which is, nevertheless, more exceptionable in many respects than it is tasteful. One objectionable circumstance, if no other, is that an appearance of littleness is incurred very unnecessarily by the diminutive windows, which give the idea of comparatively low ground-floor rooms, with a low mezzanine between them and the upper floor, whereas both tiers of windows serve to light the same rooms; nor can the upper ones be productive of good effect internally. By merely arching the lower windows, and making them correspond with the three open arches of the entrance loggia, not only the basement, but the entire structure, would have been improved, both in regard to unity of general composition, and increased loftiness for the ground-floor windows. Square-headed windows below do not accord particularly well with arched ones above, for such arrangement is the reverse of what construction would usually dictate. In the present case, too, the upper windows are only apparently lofty arched ones, the actual apertures being square-headed—a species of deception anything than either praiseworthy or ingenious, if, only because it must be detected at once on entering the rooms. No doubt, it was had recourse to in order to fill up the space between the tops of the apertures and the entablature; yet that might have been accomplished differently, by

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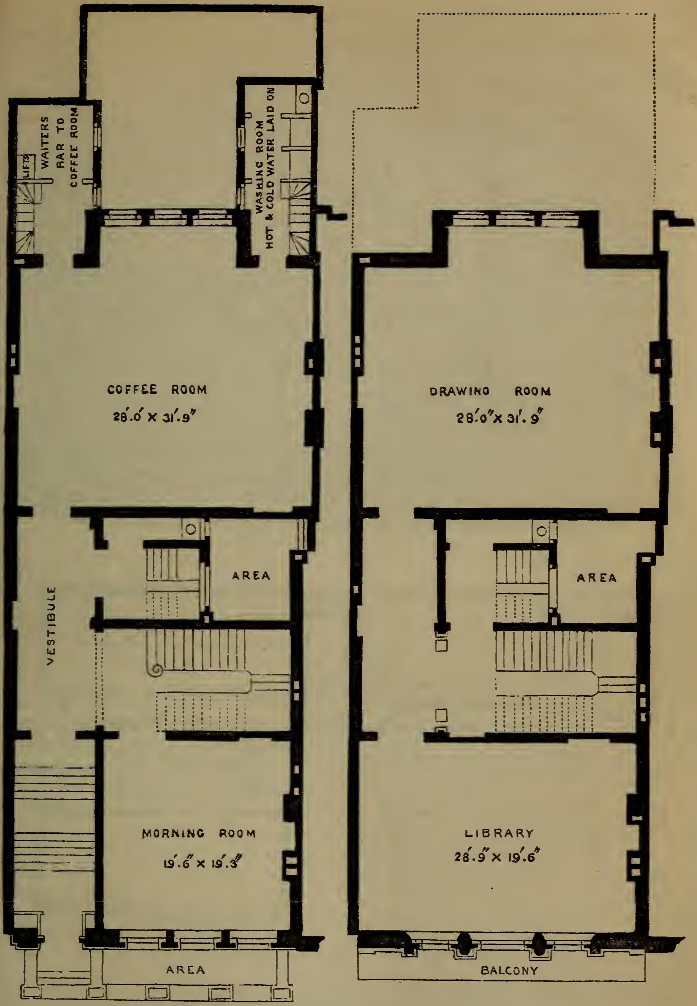
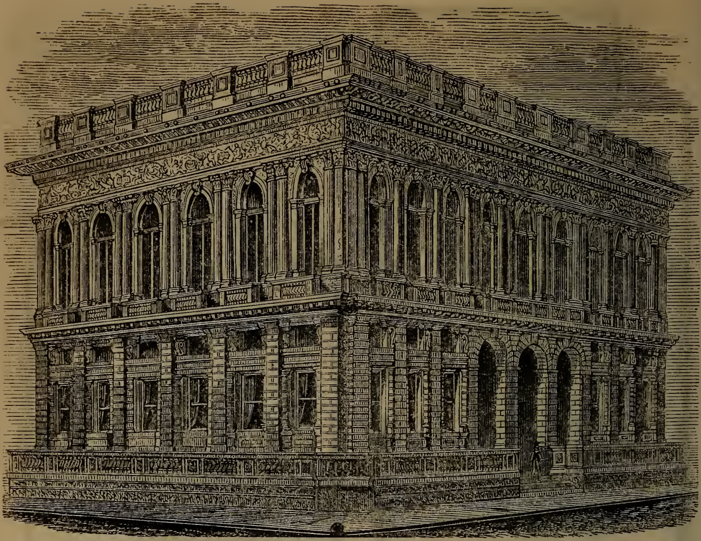
* It is to be regretted that some clubs did not—while they had the opportunity of doing so—concert together to purchase for a building site the entire block of houses between St. James's Square and Pall Mall. The structures would have had the advantage of a double frontage either way of a very desirable kind. Although varied in design they would have formed a continuous range of stately façades, an *insula* similar to that on the west side of Carlton Place; besides which, St. James' Square itself would have been most materially improved, for the houses which now occupy its south side rather disfigure its general appearance than not.

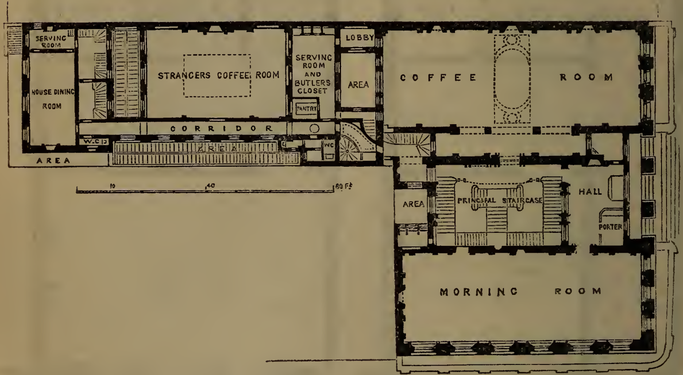

WAITERS BAR TO COFFEE ROOM
LIFTS
WASHING ROOM HOT & COLD WATER LAID ON
COFFEE ROOM
28'.0" x 31'.9"
DRAWING ROOM
28'.0" x 31'.9"
AREA
AREA
VESTIBULE
MORNING ROOM
19'.6" x 19'.3"
LIBRARY
28'.9" x 19'.6"
AREA
BALCONY

PLAN OF THE GUARDS' CLUB-HOUSE.

filling up the *tympana* of the arches with panels or other ornaments in stone, instead of glazing them. As the ground-floor plan is here given, we leave it to speak for itself, and perhaps also to confirm one of our previous general remarks. There were two competitions for this club-house, in 1847, to the first of which sixty-eight architects sent in designs, and on that occasion the first premium was adjudged to Mr. Tattersall. After that the site was enlarged, a greater frontage being obtained towards Pall Mall by the purchase of an adjoining house, and a second competition took place; but, instead of



ARMY AND NAVY CLUB-HOUSE.


SERVING ROOM
HOUSE DINING ROOM
STRANGERS COFFEE ROOM
SERVING ROOM AND BUTLERS CLOSET
PANTRY
LOBBY
AREA
COFFEE ROOM
CORRIDOR
W.C.
WC
AREA
10
40
60 Ft
AREA
PRINCIPAL STAIRCASE
HALL
PORTER
MORNING ROOM

PLAN OF ARMY AND NAVY CLUB-HOUSE.

being an open one as before, it was limited to six architects who were specially invited to it. The design chosen was that by Messrs. Parnell and Smith, and the building was commenced in 1848.

The Conservative Club-house*, in St. James's-street, erected in 1844, from the designs of the late G. Basevi and Sydney Smirke, is by far the most ornate and stately structure there situated. The design of the lower part is, how-

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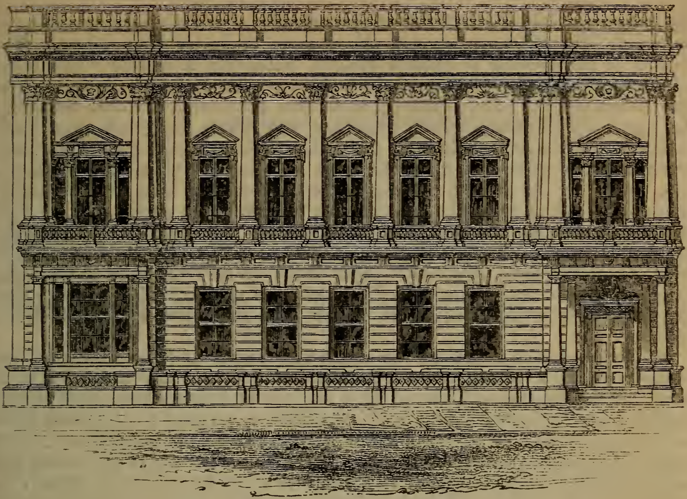
* The Conservative stands on the site of what was formerly the Thatched House Tavern, and which, notwithstanding the homeliness of its name, was a rendezvous of considerable vogue in its day, for it was patronized by the Dilettanti Society, who used to hold their meetings in the great room, where there are many portraits of distinguished members of that body. The Dilettanti now assemble at No. 85 in the same street.



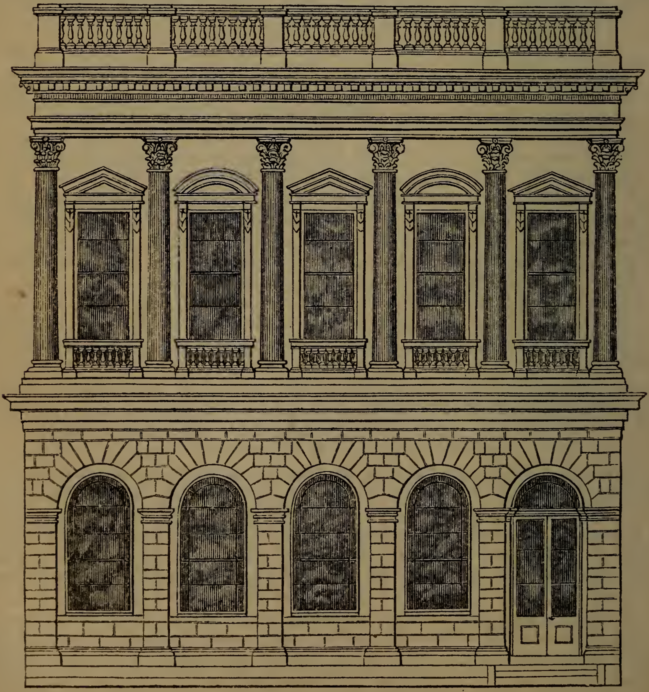
CONSERVATIVE CLUB-HOUSE.

ever, not very satisfactory, and is, moreover, rather insipid and tame, in comparison with the rest. The interior is well arranged, and contains some striking points; for besides a sufficiently handsome entrance hall, there is a larger central inner hall, with a kind of upper saloon over it, which is seen from below, through a large circular opening in its floor, through which the hall on the ground floor is chiefly lighted, the domed skylight of the upper hall, or saloon, being immediately over it. These two halls and the intervening staircase are decorated throughout, both on their walls and ceilings, with painting in encaustic, by Sang, which style of embellishment—here, perhaps, of too florid a cast—forms a strong contrast to the studied plainness and absence of colour previously affected for such parts of an interior, when our architecture seemed to labour under a sort of *chromatophobia.* In other parts of this building, too, colour has been liberally employed. The number of members is limited to 1500. Entrance fee, 26*l.* 5*s.*; annual subscription, 8*l.* 8*s.*

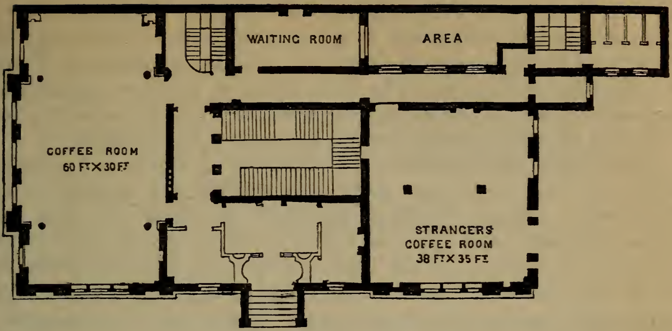
On the same side of the way, and not far from the Conservative, is Arthur's Club-house, which, together with the club itself, is said to derive its name from Arthur's chocolate-house (originally White's), which stood on the same site. The present building was erected about twenty-five or thirty years ago, by Thomas Hopper, architect, at which time it passed for more than average architectural design (see p. 304), although it now attracts less notice; so greatly have we added to this class of Club Architecture. This club is limited to 600 members, the payment of entrance fee is 21*l.*, and 10*l.* 10*s.* annual subscription.

Higher up, on the same side of St. James's-street, a few doors from Piccadilly, is what was formerly *Crockford's*—a place of most unenviable celebrity as an aristocratic gambling-house, whose walls—if walls could speak—would be able to disclose not a few transactions of very nefarious character, and that would go far towards accounting for the rapidity with which the needy often rise to affluence and insolence, and the wealthy sink down into all the obscurity of necessitousness. In 1844, Crockford departed from his terrestrial domicile in St. James's-street; and it says something for improved public morality, that on his death, the establishment was broken up, and the house remained unoccupied until May, 1849, when it was taken possession of by the Military, Naval, and County Service Club. With regard to the building itself, it was erected by Benjamin and Philip Wyatt, about the same time as York House (now the residence of the Duke of Sutherland), of which they were also the architects, and it plainly enough shows itself to be of their school. The design of the exterior is meagre enough, consisting of merely "four slices of pilaster," with four triple windows below, with a similar doorway, and five others above. Yet, although both tiers are included within the order, the upper openings alone have dressings, the others being left quite bare; which is so great and obvious an inconsistency, that it would have been well worth while to correct it when the front was renovated, and the house put into repair for its present occupiers. In spite of such offensive parsimony, when first erected even the exterior was lauded, more good-naturedly than judiciously, and the vocabulary of criticism was ransacked for the most fulsome epithets of admiration, on account of the superlative magnificence of the interior, the principal apartments being fitted up and furnished in the Louis Quatorze fashion, which was at that time rather a novelty, it having been very deservedly exploded, as being no better than expensive whimsicality and ugliness.

The Oriental Club-house, at the north-west angle of Hanover-square, was erected in 1827-8, by the same architects, but does not say much for their taste. The most that can be said of it is, that it distinguishes itself plainly enough from the other houses, and expresses its purpose by the usual club-house characteristic of only one tier of windows above the ground floor. The interior has lately received some fresh embellishment, some of the rooms and ceilings having been decorated in a superior style, by Collman. This club was founded in 1824, by Sir John Malcolm, and, as its name indicates, consists



ARTHUR'S CLUB-HOUSE.



PLAN OF ORIENTAL CLUB-HOUSE.

of gentlemen who have resided or travelled in the East, or who are officially connected with our Eastern possessions, and their administration. The number of members is limited to 800, and the annual subscription is eight guineas.

Of the other club-houses at the West-end, none are at all remarkable for external appearance, scarcely one of them having been originally built for the purpose to which they are now applied. We will mention the Alfred in Albemarle Street, established in 1808; limited number of members, 600; entrance payment, 8*l.* 8*s.*, and annual subscription, 8*l.* 8*s.* Boodle's, in St. James's Street, celebrated as one of the early clubs; Gibbon, the historian, was a frequenter. Brooks's Club, in St. James's Street, is the great Whig Club; some of the most distinguished political characters have held their meetings here. The number of members is restricted to 575; entrance fee, 9*l.* 9*s.*; and annual subscription, 11*l.* 11*s.* The Erectheum, in St. James's Square, celebrated for good dinners. Junior United Service, Charles Street, St. James's Square, built by Sir Robert Smirke. The Parthenon, 16, Regent's Street, members limited to 700; entrance fee, 21*l.*; annual subscription, 7*l.* 7*s.* White's, also a celebrated club in St. James's Street, established as early as 1698, the number of members limited to 550. The Wyndham Club, in St. James's Square; entrance fee, 26*l.* 5*s.*; annual subscription, 8*l.* More east there is, in King Street, Covent Garden, the Garrick Club, established in 1831, chiefly for members of the theatrical profession; and the Gresham Club, King William Street, near the Mansion House. The City of London Club-house, near the Excise Office, in Old Broad Street, on the site of the old South Sea-house, was built by Mr. Hardwick, 1832-3, and its façade is a Palladian composition, showing a Doric order of seven inter-columns, with as many pedimented windows, over a ground-floor, which last has also windows with dressings, placed not within arcades, but between rusticated piers, the rustication, however, being of that very spurious and un-Palladian kind, which exhibits merely horizontal channels. The dimensions of the front are 93 ft. in length, by 53 in height. On the ground-floor the principal apartments are, two dining-rooms, about 25 ft. square each, and 15 high; and a coffee-room, 60 by 30 and 30 high, which is situated in the rear of the building, with its windows opening upon a terrace towards Fountain's-court. On the principal floor are two drawing-rooms communicating with folding-doors, and thereby forming what is equal to a single apartment, 90 ft. by 25, and 18 high. The subscription entrance is 26*l.* 5*s.*, and the annual subscription 6*l.* 6*s.*

CHURCHES.

We shall find it convenient to divide them into, I. Monastic; II. Palatial; III. Gothic Parish Churches; IV. Those rebuilt by Wren; V. By later architects; VI. Built for new parishes and districts formed by Queen Anne's Commissioners, or without assistance; and VII. By, or with the assistance of, the present Commission.

Before the Reformation, the City of London had become little else than one dense mass of churches and monastic establishments. These buildings occupied *two-thirds* of the area within the walls, and were not much less abundant in the suburbs; so that, if we add to this the space occupied by the town residences of *all* the bishops, and *most* of the abbots in England (the former having large gardens and meriting the appellation of palaces), it is really difficult to imagine where the dwellings of the laity could find standing room. The final result of this state of things was disastrous to the architectural wealth of the capital, as the abundance of parish churches led to the destruction of nearly all the conventual and collegiate ones, instead of their being appropriated (as in other parts of England) to parochial use. It is to be observed that though all churches prior to the Reformation are worthy of careful inspection by the admirers of architecture, only those once attached to monasteries can in general be called complete, original, or admirable as a whole; the parish churches, with few exceptions, bearing the decided character of second-hand art, if not of apish imitation; and to judge from the few such buildings that escaped the fire, and are still standing in the eastern extremity of the city, as well as from old views of the others, it does not appear that the ninety-eight destroyed in that catastrophe could have been any great artistic loss. It was far otherwise with the conventual churches, of which the avarice of Henry VIII. left us, in the whole metropolis, only four entire, and a few fragments. These, though all escaping the fire, have partly fallen a prey to recent Vandalism; but all that remains of them will be examined by every admirer of the beautiful and the true.

I. *Conventual and Collegiate Churches left standing, wholly or in part.*

1. St. Bartholomew, Smithfield (only portions): *temp.* Henry I. to John.
2. The Temple Church (entire): *temp.* Henry II. and Henry III.
3. St. Mary Overy, now St. Saviour's, Southwark (left entire, but the nave destroyed in 1840): *temp.* Henry III. chiefly.
4. Westminster Abbey (entire): *temp.* Henry III. to Edward IV.
5. St. Stephen's Collegiate Chapel (destroyed, except the crypt, in 1836): *temp.* Edward I.
6. Church of the Austin Friars, now Dutch Church, Broad Street (the nave only, since much remodelled): *temp.* Edward III.
7. Henry the Seventh's Chapel (entire).
8. St. Katherine's, near the Tower (since destroyed to make the Docks; monuments removed to St. Katherine's, Regent's Park): *temp.* Henry VII. chiefly.
9. Church of the Knights Hospitallers, Clerkenwell (destroyed, except the east window): *temp.* Henry VII. and VIII.

For further accounts of these (except the two last), see "Architecture" (pp. 131–172).

II. *Private or Palatial Chapels left from before the Reformation.*

1. St. John's, in the White Tower (entire): *temp.* William the Conqueror.
2. Chapel of Lambeth Palace (the walls only): *temp.* Henry III.
3. Chapel of Ely Palace, Holborn (walls only): *temp.* Edward II. and III.
4. Chapel of Savoy Palace, Strand (walls only): *temp.* Henry VII.

5. Chapel in St. Stephen's Cloister, Westminster Palace (entire): *temp.* Henry VIII.
6. Chapel Royal, St. James's Palace (much remodelled): *temp.* Henry VIII.

Except the fourth and last, which are not remarkable, these will also be found described in "Architecture" (pp. 127–140).

III. *Parish Churches that escaped the Fire, and remain wholly or in part.*

1. St. Pancras, Somers Town (Norman; nearly all remodelled in 1848).
2. St. Ethelburga's, Bishopsgate Street (some early Gothic fragments).
3. St. Margaret's, Westminster (remodelled, except the pillars and arches).
4. St. Bartholomew's the Less, in the Hospital (rebuilt, except one arch).
5. St. Sepulchre, Newgate (the porch only).
6. St. Giles's, Cripplegate (some external fragments).
7. Allhallows, Barking, near the Tower (nearly entire).
8. St. Olave, Hart Street, near the above (much remodelled by Wren).
9. St. Helen's, Bishopsgate.
10. St. Peter's, in the Tower (externally remodelled).
11. St. Mary's, Lambeth.
12. St. Andrew's Undershaft, Leadenhall Street.
13. St. Catherine Cree, Leadenhall Street.

Except the first three, these all belong to the very latest period of Gothicesque building, and contain little worth notice but the monuments.

IV. *Parish Churches burnt, and rebuilt by Wren.*

Within the walls of London, before the fire, the average extent of a parish was about *three acres.* Only about half the destroyed churches, therefore, were rebuilt, and almost every one now serves for two united parishes. Notwithstanding this, they stand so thick as to distinguish the original city, at a distance, by its dense crowd of steeples, and to mark its precise limits by their sudden cessation and violent contrast with the remaining parts of the metropolis, where the ugly modern imitations break the horizon only at wide intervals. A large public building, such as the Bank or Exchange, cannot be erected, in the city proper, without clearing off two or three churches; and new streets can hardly be planned so as to avoid them. Their superabundance and the extreme smallness of their congregations arise from the fact, that the city, when they were built, contained *six* times its present population. From a city of convents it had become, in Wren's time, one of lodging-houses; from which it has since passed into one of warehouses. From a dwelling it has become a mart, crowded indeed, in the day, but depopulated by night and on Sundays. Boxes, bales, and barrels have driven out their owners into the suburbs, and unfortunately they cannot carry their churches with them.

We have arranged the following list of Wren's churches (all of which will repay inspection), together with the old ones worth seeing, in such an order that they may all be conveniently visited, in three circuits, without unnecessary waste of steps. The visitor in each case is supposed to enter the city from the west.

I.—South Walk, starting from the *Temple Church.* Tudor Street. Earl Street. St. Anne's Hill. 1. *St. Andrew's by the Wardrobe,* a very plain work. Back to Thames Street. 2. *St. Benedict's* (commonly *Benet's*), *Paul's Wharf,* one of the most successful of Wren's exteriors of the most unpretending class. Peter's Hill. Old Fish Street.

3. *St. Mary Magdalen.* Old Fish Street. 4. *St. Nicholas.* Old Fish Street Hill. Thames Street. 5. *St. Mary Somerset*, or *Somer's-hythe.* Thames Street. 6. *St. Michael, Queenhithe.* The fine carving about this church is by Grinling Gibbons. Thames Street. Garlick Hill. 7. *St. James, Garlickhithe*, having one of the finest of Wren's campaniles of the tower class. Maiden Lane. 8. *St. Michael Royal*, or St. Michael, College Hill, another fine belfry of the same class. The predecessor of this building was founded as a collegiate church by the executors of the famous Lord Mayor Whittington, who was buried here. College Street. Dowgate Hill. Thames Street. 9. *Allhallows the Great.* The carved oak screen in this church was presented, it is said, by some Hamburgh merchants. Thames Street. 10. *St. Magnus*, having a fine and unique steeple, which, it was feared, would have to be sacrificed when the street (Fish Street Hill, which was the approach to Old London Bridge) was necessarily widened; but Wren had foreseen the necessity, and so constructed the ground story that its sides could be easily opened, as we now see them, to admit the foot-way through it. In this church are the remains of Miles Coverdale, the first translator of a complete English Bible; removed from a church that was destroyed to erect the Royal Exchange, and brought here to the parish of which he was once rector; King William Street. 11. *St. Clement's* (near the bottom of Clement's Lane). Cannon Street. Abchurch Lane. 12. *St. Mary Abchurch* or *Up*-church, which contains some excellent carving by Gibbons, and some paintings by Sir James Thornhill. Back to Cannon Street. 13. *St. Swithin's* *, containing in its south front the celebrated "London Stone," supposed to have been a Roman milliary. It is a large mass nearly buried, the ground here having accumulated from 15 to 20 feet; at which depth mosaic pavements and other Roman remains are constantly found. Cannon Street. Walbrook. 14. *St. Stephen's, Walbrook*, the most celebrated and beautiful of Wren's churches (see pp. 192, 193), chiefly on account of its interior, but the exterior also would be elegant if exposed, and the belfry is very noticeable. Back to Cannon Street. Budge Row. 15. *St. Anthony's* (corruptly *Antholin's*), a church ingeniously fitted to an irregular site, and having a very elegantly-planned interior. Watling Street. 16. *St. Mary's the Elder*, or *Aldermary Church.* This is a restoration by Wren of the former church, which was built by a citizen named Keble, who died in 1518. A Mrs. Rogers left 5000*l.* towards the present building, on the condition of its being a copy of the old, which it very probably is in all except mere details and the omission of buttresses. We suspect, however, that Keble's church had them, and a real instead of a sham vaulting, as at the nearly contemporary churches of Bath Abbey, and Redcliff, Bristol. Basing Lane. Bread Street. 17. *St. Mildred, Bread Street*, having one of the neatest of Wren's plain towers, a

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* St. Swithin, hardly remembered now but as "clerk of the weather-office," was a pious bishop of Winchester, and tutor of no less a scholar than the great King Alfred.

fine interior, and some good wood-carving. Back along Bread Street to Watling Street. 18. *Allhallows, Bread Street*, outside which is an inscription to the memory of Milton, who was born in this parish. Friday Street. 19. *St. Matthew's.* Back to Watling Street. 20. *St. Austin's* (or Augustine's) named after the famous missionary (as a church at the other end of Old St. Paul's was named after his master St. Gregory). The steeple is admirably adapted to contrast with and give distance to the grand dome of the cathedral seen behind it. St. Paul's Churchyard, Ludgate Street. 21. *St. Martin's, Ludgate.* The steeple is evidently designed with the same end as the last, and greatly enhances the view of St. Paul's from Fleet Street. The interior is also well worthy of notice. Ludgate Hill. Fleet Street. 22. *St. Bride's* (or Bridget's). The interior is equally excellent in its kind with the celebrated steeple, and the east window is a fine specimen of modern glass-painting. Fleet Street. Temple Bar. 23. *St. Clement Danes*, which derives its name, according to some, from being the burial place of Harold. Various other reasons are given. The fire extended no further west than the Temple Church, which had a most narrow escape. St. Clement's, therefore, was not burnt, but age and decay led to its reconstruction in 1680, and Sir Christopher Wren gave his services gratuitously. An uncommon number of distinguished persons are buried here.

II.—East Walk, starting from the Bank. 1. *St. Mary Woolnoth*, by Wren's pupil, Hawkesmoor, is a building of great merit both externally and internally (see p. 198), and contains much handsome wood-carving. Lombard Street. 2. *St. Edmund's*, named after the Saxon king "and martyr." Its front is well adapted to the situation opposite a narrow street. 3. *Allhallows, Lombard Street.* 4. *St. Benet* (or Benedict) *Gracechurch*, properly Grasschurch, "of the Herb Market there kept." It is curiously planned, like many other of Wren's churches, to fill every inch of an irregular site. Gracechurch Street. Eastcheap. Botolph Lane. 5. *St. George's, Botolph Lane.* George Lane. 6. *St. Mary at Hill*, which has been rebuilt since Wren's time, and retains only the east end as designed by him. Within is some fine recent wood-carving by Mr. Rogers. St. Mary's Hill. 7. *St. Margaret Pattens*, named, like many of the city churches, after articles once sold in their vicinity. It contains some fine carving. Idol Lane. 8. *St. Dunstan's in the East.* Only the tower of this church is by Wren. The remainder was rebuilt in 1817, in a more Gothic style as regards details, but lower, and with inferior proportions. Up St. Dunstan's Hill. Great Tower Street. 9. *Allhallows Barking*, the most complete mediæval parish church remaining in London. It was formerly dependent on the Convent of Barking in Essex. The pillars and arcades are of two different periods, those towards the west apparently early Gothic, but devoid of elegance. The eastern front and outer walls are not earlier than Richard III., who is said to have rebuilt the church, and attached to it a college of priests. The east window has been called in the jargon of certain architectural antiquaries "late Decorated," which term (it is necessary for most readers to be informed) does not refer to the decoration, but simply to the *date; "decorated"* being a technical term for all buildings (no matter how plain) erected in the age of the first three Edwards. But this window (notwithstanding the absence of vertical mullions in the head) will, we think, be referred by any careful observer of such works to no earlier date than Henry VII. The church contains some brass monumental tablets, but not elegant, being no older than the sixteenth century. Seething Lane. 10. *St. Olave's, Hart Street*, another church that escaped the fire, but has been much patched by Wren. Crutched Friars. Mark Lane. 11. *Allhallows Staining.* This also escaped the fire, but falling to ruin a few years later, was rebuilt, except the tower. Billiter Street. 12. *St. Catherine Cree Church* (a corruption of Christ Church), so called because it stood within the precincts of the great monastery of Christ-Church or Trinity, Aldgate. This very early Protestant Church is a specimen of "King James's Gothic," attributed by some to Inigo Jones. It was Laud's pompous consecration of this building that formed a chief ground of accusation against him. Leadenhall Street. 13. *St. Andrew's Undershaft*, (from a Maypole that overtopped the former church, and was destroyed by the Puritans as "an Idol.") This very complete Tudor church dates from 1532. There are some curious monuments, the best and most interesting being that of Stow the historian of London. Lime Street, to Fenchurch Street. 14. *St. Denys* (or *Dionysius*), called *Back Church,* from its position behind some houses, one of the poorest of Wren's works. Fenchurch Street. Gracechurch Street. 15. *St. Peter's, Cornhill*, one of his best, especially the interior. It is the only church in London, besides Allhallows in Thames Street (see above), that has a screen between the body and the chancel. This was put up by Bishop Beveridge, when rector here. Cornhill. 16. *St. Michael's, Cornhill*, remarkable for being about the best of Wren's imitations of the Gothic, especially in its tower, which is by no means similar to the old one (date 1421), of which a drawing is extant, but is much more artistic and original. Cornhill. Mansion House Street. 17. *St. Mildred's in the Poultry.*

III.—NORTH WALK, starting from Holborn. 1. *St. Andrew's, Holborn.* This (like St. Clement Danes) was just too far west to be touched by the fire, but was yet found to require being rebuilt by Wren. It has nothing remarkable but a powerful organ, and a good modern glass-painting in the east window, by Price. Skinner Street. 2. *St. Sepulchre*, which (like St. Bride's), though outside the city walls, did not escape the fire, except its tower and porch. The latter is gravely said, in a work of the present century, to have had its *outside* "handsomely modernised" (!) Such is the power of fashion. The *inside*, we must infer, was thought *un*handsomely antiquated. The remodelling of the tower and rebuilding of the rest are evidently too barbarous to be attributed to Wren, and there is said to be a print as late as 1736, representing the old Gothic church. Newgate Street. Christchurch Passage. 3. *Christ Church.* This is one of the very finest of Wren's works, whether we regard the steeple or the interior. The former, indeed, has been shorn of its graceful outline and all its picturesqueness by the removal of a few vases; and the latter is painfully disfigured by some savage's chequer-work of coloured glass, but not by the galleries, though they accommodate the whole 900 scholars of Christ's Hospital. How different from the wretched patchwork and hideous deformity found necessary in recent churches, whenever they are required to provide gallery room for a tithe of that number! Back to Newgate Street. Cheapside. Foster Lane. 4. *St. Vedast's*, another fine and original steeple. Back to Cheapside. 5. *St. Mary le Bow*, or Bow Church, where the most splendid of all Wren's steeple compositions appropriately contains the finest and most celebrated bells in London, and graces a building which, as Stow says, "for divers accidents happening there, hath been made more famous than any other parish church of the whole city or suburbs." The name is derived from the *arches* of the original structure, or of its crypt, which still exist, though so buried under the dust of nearly eight centuries as to form only the foundation of the present fabric. The Court of Arches also took its name from this apartment, which is now a pestiferous catacomb. It dates from soon after the Norman Conquest, and was the first arched or vaulted structure in London (by no means the first in England) *. Such has been the accumulation that the deep foundations of the belfry (one of the most substantial, as well as beautiful, in existence) stand on the pavement of a Roman road, the northern limit, as Wren thought, of the city walled by Theodosius †. Cheapside. King Street. 6. *St. Lawrence*, which has the richest exterior among Wren's churches, and was the most expensive of them, costing 11,870*l*. The interior contains some fine wood-carving, and being lined with a Corinthian order on a large scale, is still perhaps the most imposing one he has left, though sadly mutilated by the loss of the north aisle (which is inclosed and appropriated to some other purpose), and the erection of an ugly gallery to supply part of the room thus lost. The plan of this building is said to represent the gridiron, but we cannot trace the resemblance. Gresham Street. Old

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* Stratford-le-Bow was similarly named after the bridge leading across the Lea into Essex, built in the time of Henry I.

† The former "Bow Bell" was famous for releasing the London apprentices at 9 o'clock. 'This Bell," says Stow, "being usually rung somewhat late, as seemed to the young men, prentices, and others in Cheap, they made and set up a rhyme against the clerk as followeth:—

> 'Clerke of the Bow Bell, with the yellow lockes,
> For thy late ringing thy head shall have knocks.'

Whereunto the clerk replying, wrote:—

> 'Children of Cheape, hold you all still,
> For you shall have the Bow Bell rung at your will.'"

The term Cockney (native of Cocaigne, or the land of gastronomy, a name anciently earned by the city of London) is supposed to apply only to those born within the sound of Bow Bell.

Jewry. 7. *St. Olave's, Jewry*, one of the smallest and poorest of Wren's erections, and we believe almost the only one with a ceiling entirely flat. The variety of forms he gave to this most important part redeemed even the humblest of his other works from absolute meanness. Back to Gresham Street. Lothbury. 8. *St. Margaret's, Lothbury*, chiefly remarkable for a carved font by Grinling Gibbons, with allegorical figures on the cover, and three Scripture pieces below. Back to Gresham Street. Coleman Street. 9. *St. Stephen's, Coleman Street.* Back to Gresham Street. Basinghall Street. 10. *St. Michael's, Basinghall* (corruptly Bassishaw), densely surrounded, and the only building of Wren's that shows a decided deficiency of foundation. St. Michael's Court. Aldermanbury. 11. *St. Mary's, Aldermanbury.* Love Lane. 12. *St. Alban's*, apparently a restoration of the former church, which was either rebuilt or repaired by Inigo Jones in 1632. If not a restoration it must be considered the best specimen of Wren's Gothic. Wood Street (southward) to 13. *St. Michael's, Wood Street.* Huggin Lane. Gresham Street 14. *St. Anne and Agnes*, north of the Post Office, a square interior, similar to St. Martin's, Ludgate, and originally very symmetrical. Aldersgate Street. Little Britain. Duke Street. 15. *St. Bartholomew's the Great*, a remnant of Rahere's Priory church (see "Architecture," pp. 131–135).

Of the more remarkable of Wren's churches it is observable that St. Mary le Bow, St. Lawrence, and St. Stephen's, Walbrook, were among the *first* designed ;—St. Vedast's, St. Bride's, Christ Church, and St. Magnus, among the *last.* The erection of the churches extended from 1668 to 1705, but it does not appear that any were *commenced* later than 1680.

All Wren's churches, fifty in number, replaced old ones, except St. James's, Westminster, which was a new parish taken out of St. Martin's, which had itself, in Henry VIII.'s time, been taken out of St. Margaret's, and was yet to be the parent of several, each larger than the whole original city. Except this, and St. Clement Danes, they are all within the city as now defined, and with the further exception of St. Andrew's, Holborn, and St. Bride's, were all within the walls of the city proper. Six of Wren's churches have now disappeared, viz. :—St. Christopher's le Stocks (destroyed for the enlargement of the Bank), St. Bartholomew's (for that of the Exchange), St. Michael's, Crooked Lane (for the clearing of King William Street), St. Benet Finch to afford a site for a building not yet commenced ; and St. Mary at Hill and St. Dunstan's in the East (except its tower) have been rebuilt on new designs.

V. *Churches that escaped the Fire, but have been rebuilt since.*

Besides the group of old churches above mentioned, still standing in the east end of the city, all those situated along its northern boundary escaped, but were, in the last century, rebuilt with excessive meanness and parsimony of thought. These are, beginning from the east,

—St. Botolph's, Aldgate; St. James's, Duke's Place, Aldgate; St. Botolph's, Bishopsgate; Allhallows, London Wall; St. Alphage, London Wall; St. Giles's, Cripplegate (partly burnt and patched up); St. Botolph's, Aldersgate; St. Bartholomew's the Great, and the Less; St. Sepulchre's; and St. Dunstan's, Fleet Street (rebuilt in handsome modern Gothic in 1831–3). Four churches also in the heart of the city were so little injured as to admit of patching, viz.: St. Catherine Coleman, Fenchurch Street; St. Mary's Woolnoth; St. Peter le Poor, Broad Street; and St. Martin Outwich, at the junction of Threadneedle and Bishopsgate Streets. The second of these Hawkesmoor replaced in 1716, by a beautiful erection already mentioned with those of Wren, as one of the admiranda. The others have been rebuilt by later artists, and contain nothing remarkable. The following are the churches rebuilt since Wren's time throughout the metropolis. Those marked *Conv.*, replace conventual churches; and those with an asterisk will repay inspection as architectural works.

Old St. Luke's, Chelsea. Chiefly in the 17th century.
St. Mary Magdalen's, Bermondsey. (*Conv.*) 1680.
St. Margaret's, Westminster. 1682, and at various later dates.
St. Giles's, Cripplegate. At various times.
St. Thomas's, Southwark. 1702.
St. Mary's, Rotherhithe. 1714-15.
*St. Mary's Woolnoth, City. 1716. By Hawkesmoor.
*Christ Church, Spitalfields. (*Conv.*) Hawkesmoor.
St. John's, Clerkenwell. (*Conv.*) 1723.
*St. Martin's, Trafalgar Square, Westminster. 1721-6. Gibbs.
St. James's, Duke's Place, Aldgate. 1727.
*St. Botolph's, Bishopsgate. 1725-8. James Gold.
St. Catherine Coleman, Fenchurch Street. 1734.
St. Giles's, Bloomsbury. 1734. Flitcroft.
St. Olave's, Tooley Street, Southwark. Flitcroft.
St. Sepulchre, Newgate.
St. George's, Southwark. 1733-6.
Christ Church, Blackfriars Road, Surrey. 1737.
*St. Leonard's, Shoreditch. 1740. Dance, sen.
St. Botolph's, Aldgate. 1741-4. Dance, sen.
St. Mary's, Islington. 1751-4. L. Dowbiggin.
Allhallows, London Wall. 1765. Dance, jun.
St. Mary's, Whitechapel.
St. Mary's, Kensington.
St. Mary's, Battersea. 1776.
St. Alphagé, London Wall. 1777. Dance, jun.
St. Bartholomew's, in the Hospital. (Pseudo-Gothic). 1789. Dance.
St. Botolph's, Aldersgate. 1790. Dance.
St. Peter's le Poor, Broad Street, City. 1790. J. Gibson.
St. Mary's, Paddington. 1788-91.
St. James's, Clerkenwell. (*Conv.*) 1788-92.
St. Paul's, Covent Garden (Jones's Church). 1795. Hardwicke, sen.
St. Martin's Outwich, Threadneedle Street. 1796. Cockerell, sen.
St. Augustine's, Hackney. 1798.
*St. Dunstan's, Fleet Street. 1830-33. Shaw.
St. Saviour's, Southwark. (*Conv.*) 1840. The nave only.
St. Margaret's Chapel (now Christ Church), Broadway, Westminster. 1843.
St. Pancras', Somers Town. (Pseudo-Norman.) 1848.

Thus, out of thirty-eight old structures (all except four, anterior to the Reformation), some displaying the genuine splendour of the monastic architecture, and nearly all containing that abundance of refined thought by which the mediæval builders endeavoured to glorify God with the best of all He had given them; out of all these, only six have been replaced by buildings with any claim whatever to be considered works of thought. Shame would now gladly draw a veil over the rest of these disgraceful productions. It has been well asked, who could ever have anticipated in any previous stage of church architecture, and especially of its ancient glory in this country, that, in the nineteenth century, an English church would come to mean four screens of plastered brick, covered by about an eighth of an acre of plastered laths? To such a pitch did the constant pursuit of an object the direct reverse of art (viz.—*economy of thought*), at length reach. It is not the economy of handiwork in these buildings that offends us, for some of the Norman churches have nearly as little; and the ever-esteemed St. Sophia *quite* as little in proportion to its size. Still less is it their economy of material (a quality distinguishing the works of nature, and therefore a beauty in temples to the Author of nature). No, with all their parsimony, these frail tottering erections have no economy of matter, for, as a late architect calculated, about a fourth of what they contain is always useless burthen, and another fourth employed in supporting that burthen;—and the same author truly observed, "what a shame is it to man, to pile up in a rude coarse crazy and unhandsome manner, the good materials with which Providence has blessed him, to mar them by folly and ignorance [*wilful* ignorance in order to save thought] and to call such an assemblage of mal-formation *a temple!*" To object to these buildings for their fancied *plainness* is a double error: first, because plainness has no necessary connection with ugliness or profanity in building (as the Norman and Byzantine examples above mentioned prove); and, secondly, because these odious works are the reverse of plain. *Plain!*—why everything visible in them is ornament. What is the ceiling?—what are its hanging mouldings and lumps of plaster?—what are the walls and all other surfaces?—what are the sham stone?—the sham marbles, the sham oak?—What is every feature and appearance in the exterior?—the mode of arranging the bricks* to hide the real structure, the mode of counterfeiting in the windows the appearance of holes, the mode of disguising how the wall above them is supported, the mode of hiding the roof or its commencement, by keeping it behind the wall; and yet adding a sham cornice to counterfeit the effect of its projecting over? If all these things be not ornaments, what is their use? We assert that these hideous preaching-boxes are more ornamented than Henry VII.'s chapel, for their real structure is entirely hidden by ornament, within and without.

With the present century came the next change in church building; from the bricklayer's mock packing-case to the architect's mock temple and mock minster. Both the pseudo-Greek and the pseudo-Gothic treatments appeared about the same time, though the former held for some years nearly undisputed sway. Our next list of churches will contain most of its productions.

In this as the former list, the buildings near the beginning exhibit the final stage of church *architecture* properly so called; the body of the list being chiefly composed of the anti-artistic meeting-houses of the reign of George II. and III.; and the end of it showing the rise and progress of the new substitute for art, the histrionic representation of past productions. The seventy or eighty years absolutely without church architecture, form indeed a fit and necessary pause between the last lingering vestiges of the *reality* and the gradual appearance of its *counterfeit.*

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* Technically, the "Flemish bond facing."

VI. *Churches of New Parishes and Districts formed since the Fire, including those built by Queen Anne's Commissioners, but not those built by the aid of her Majesty's present Commission.*

Name and Situation.	Mother Parish.	Style, Date, Architect, &c.
*St. James's, Piccadilly	St. Martin's	1680. Wren.
St. Anne's, Soho	St. Martin's	1686. Hakewill, sen.
*St. Mary's le Strand	St. Clement Danes'	1714-17. Gibbs.
*St. John's, Westminster	St. Margaret's	1721-8. Archer.
*St. George's, Hanover Square	St. Martin's	1724. Gibbs.
St. George's in the East	Stepney	1730. Hawkesmoor.
St. Anne's, Limehouse	Whitechapel	1729. Hawkesmoor.
*St. George's, Hart St., Bloomsbury	St. Giles's	1731. Hawkesmoor.
St. Luke's, Old Street	Cripplegate	1733.
St. George's, Queen Sq., Bloomsbury	St. Andrew's, Holborn	1736.
St. John's, Gt. James St., Bedford Row	St. Andrew's, Holborn	
Providence Chapel, Gray's Inn Lane	St. Andrew's, Holborn	
St. James's, Bermondsey	Bermondsey	
Bedford Chapel, New Oxford Street	St. George's, Bloomsbury	Remodelled 1844.
Percy Chapel, Rathbone Place	St. Pancras'	
Curzon Chapel, May Fair	St. George's, Hanover Sq.	
Foley Chapel, Portland Road	Marylebone	1766.
Fitzroy Chapel, London St., Fitzroy Sq.	St. Pancras'	
Bayswater Chapel, Oxford Road	Paddington	
Portman Chapel, Baker Street	Marylebone	
Margaret Chapel, Margaret Street	Marylebone	
St. Peter's, Vere Street, Oxford Street	Marylebone	
Quebec Chapel, Quebec Street	Marylebone	
Brunswick Chapel, Upper Berkeley St.	Marylebone	
*New Marylebone Church, New Road.	Marylebone	1813-17. Hardwicke, sen.
West Street Chapel, Seven Dials	St. Giles's	
Long Acre Chapel	St. Martin's	
York Street Chapel, St. James's Sq.	St. James's	
Charlotte Street Chapel, Pimlico	St. George's, Hanover Sq.	
Trinity Chapel, Conduit Street	St. George's, Hanover Sq.	
St. Mary's Chapel, Park Street	St. George's, Hanover Sq.	
Abp. Tenison's Chapel, Regent Street	St. George's, Hanover Sq.	
St. James's Chapel, Hampstead Road	Pancras	
Christ Church, Paradise Row	Chelsea	
St. Saviour's, Turk's Row	Chelsea	
All Saints', Poplar	Limehouse	1817.
*St. John's, Clapham Road	Clapham	Pseudo-Grecian.
*New St. Pancras', New Road	Pancras	Ditto. 1819-22. Inwood.
St. Paul's, Shadwell	Stepney	1821. Walters.
St. Peter's, Trafalgar Sq., Walworth	Newington	1823-5. Soane.
Holy Trinity, New Road	Marylebone	Soane.
St. Paul's, Deptford	Deptford	
St. John's, Waterloo Road	Lambeth	1823-4. Bedford.
St. Mark's, Kennington Common	Lambeth	
Christ Church, Albany St., Regent's Park	Pancras	Soane.
St. Peter's, Eaton Square, Pimlico	St. George's, Hanover Sq.	Pseudo-Grecian. 1826.
All Saints', Caledonian Road	Islington	Pseudo-Gothic.
*St. Katherine's, Regent's Park	Pancras	Ditto. 1827. Poynter.
St. Peter's, River Lane, Islington	Islington	Ditto. 1835. Barry, R.A.
St. George's, Battersea	Battersea	Ditto. 1845.
*St. John's, Notting Hill, Oxford Road.	Kensington	Ditto. 1845.
All Saints', Westminster Road	Lambeth	Pseudo-Norman. 1846.
*St. Michael's, Chester Sq., Pimlico	St. George's, Hanover Sq.	Gothic. 1847.
*St. Stephen's, Rochester Row, Westminster	St. John's, Westminster.	Ditto. 1848-50. Ferrey.
St. Barnabas', Pimlico	St. Paul's, Knightsbridge.	Ditto. 1849.
*(Unconsecrated), Vauxhall Bridge	St. John's, Westminster.	Ditto. 1851. (Unfinished.)

Among these buildings, those marked with an asterisk are worth inspection, externally at least, though but very few, indeed, of them have any pretension to internal design. This is especially the case with the earlier ones, or those of Wren's successors, for, as already observed, beauty, at length driven out of the churches, still lingered awhile on their exterior, among the cumbrous superfluities that represented the features of classic building. Some of these works, (as St. Martin's, St. John's, Westminster, and Greenwich Church,) were very costly, and Walpole observed of St. Mary-le-Strand, that it was "more creditable to the piety than the taste of the nation;" which was true enough of all Queen Anne's churches, if piety be displayed by money rather than by expenditure of thought and love of truth, which is a question admitting of doubt. The conspicuous situation of St. Martin's has rendered it a favourite and the best known of these buildings; but St. George's, Hanover Square, displays in almost every part more genuine taste. St. George's, Bloomsbury, has a finer portico than either of them, but little else to admire (see *Architecture*, p. 199). The visitor should not neglect the exterior (only, for the interior is excessively poor) of St. John's, Westminster, which is noble in its general form and arrangement, though disfigured in the detail by conceits more false and corrupt than this country ever saw before or since, till within the last few years*.

With regard to the buildings towards the end of the list, or those belonging to the age of mimic architecture, whether representing Grecian or mediæval patterns, one description will apply to them and to those in the next and last catalogue.

VII. *Churches Erected wholly or partly by the present Church-building Commission* (for List, see pp. 320, 321).

It will be seen from the whole of this and the latter part of the previous list, that, in the present century, our church building has at length become a mere matter of scenic representation; first of Grecian and then of mediæval building; a mere art of manufacturing mock-antiques. This fact cannot be more prominently displayed than in the authoritative documents whence our last table is compiled—the annual reports of the Church-building Commissioners. Besides the date on which each building is begun or finished, they state, in another column of their schedule, the date of its "style and character," *i.e.*, the precise period in which (to borrow an expression from other works of fiction) "*the scene is laid*," in what century, from the eleventh to the fifteenth, in what reign, sometimes even in what year. And, as, in a playbill, we have first the name of each character, and then that of the actor; so, in the programme of this stone masquerade, there comes first the date of the building to be represented, and then of that which is to represent.

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* The criticism copied into every account of this church, we believe since its erection, is a capital instance of what, in England, passes for taste. It has been the fashion to say nothing of its abominable details, but object to its really fine form, as "resembling a parlour table upset, with its legs in the air." The resemblance consists in having four summits—"There is a river in Macedon; and there is moreover also a river at Monmouth"—There are four legs to a table, and four turrets to St. John's; but further than this we cannot conceive what inverted table could bear the most distant likeness to this building (though most modern tables would certainly very closely represent the cornice, parapet, and pinnacles of the stereotyped Anglo-Gothic church tower; but of this resemblance we hear nothing). As for the *principle* of the objection, it is obvious that, if it be worth anything, St. Paul's and all domes must be at once condemned as resembling inverted basins; all the Gothic spires, as resembling extinguishers; all columns, as resembling posts; and, in short, all straight-lined objects must be banished for resemblance to furniture, and all curved ones for resemblance to pottery. Even if those forms only which other arts have borrowed from architecture are to be forthwith abandoned by her (as fashionists abandon a garb when it has descended to the vulgar), what refuge remains? and what becomes of *truth* in design if *novelty* is to be the main object? Meanwhile, the result of a total absence of real criticism is that the richest city in the world erects, and (what is worse) *boasts of*, such works as the Coal Exchange.

With regard to the success of this new kind of art, the first great experiment, that of mimic Hellenism, carried on for many years at vast expense, is now universally regarded as a failure. The imitations of the most sublimely beautiful productions human art has ever achieved or is likely to achieve, are now shunned by all for their intense ugliness*. Whether the second experiment, that now in process upon mediævalism, succeeds any better, the next generation must decide; for the experience of all fashion seems to show that we have now no means of knowing what is beautiful or what ugly, till it has gone *out of* fashion. The detection of the true causes of failure in the Grecian experiment might be supposed (since we may readily see that the very same causes must operate on the Gothic) to afford some clue to a right anticipation of the character our present works will permanently bear. But no; we cannot "see ourselves as others see us." Omnipotent fashion learns nothing from experience, but must have her course, though it cover the land with monuments that our children will hide for shame.

The "Grecian" churches make no attempt to imitate more than the *exterior* of a temple; for, in the interior, as in every other part for which no pattern remains, the English designer is of course left to his own resources; and his utter impotence the moment the Greeks desert him necessarily appears in every feature of *use* (as distinguished from *disguise*), from a window-bar to a bell-tower, and from a pew-door to the whole interior ensemble, which accordingly differs in no way from the bricklayer's chapels of the last century, being simply a cell inclosed by five plastered planes, and encumbered with the packing-boxes called galleries, hanging without visible support or propped on iron rods. It has been well observed that these interiors, by their low proportion and vast inverted floor overhead, seem to aim at an expression exactly the reverse of all former temples, and, instead of raising, to prostrate the eye and mind into the dust.

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* And instead of drawing thence the true conclusion, that the so-called "*copies*" were no copies at all, but only *apish mimcs*, some of the nation disgraced by them actually think to throw the blame on the originals themselves! Englishmen, of all men in the world, are the first to have the ridiculous audacity to condemn Grecian art! To perceive the supreme richness of this farce we must remember that to the Greeks belonged the unique power of producing, in architecture (as in their literature and other arts), things *fashion-proof*—ridicule proof—things that, amid all the changes of 2000 years, whether neglected or admired, have never been laughed at; never, like the fashions of yesterday, become quaint or antiquated; while to the modern English belongs the no less peculiar talent of erecting things whose premature celebrity may be trumpeted through the world, and yet not survive their own completion; things the idols of one generation, and the laughing-stocks of the next. To the former *alone* did it pertain to erect things that the rest of the world, without exception, should admire even to mimicry; to the latter *alone* to mimic the works of every other age and clime, and fail ridiculously in every case, confess ourselves beaten at every point, plead our poverty in every comparison, even with the works of poor savages, and, in all our search after styles, to find not one so poor, so cheap, so easy, that we may rival it; not one that we can do more than "*limp* after in *base* imitation." Thus ancient Greece and modern England are exact antipodes in the world of art; and when, on such criteria as St. Pancras and the *outside* of the British Museum, we presume to blame the Greek architecture, it is as if some Japanese, having failed in an attempt to copy a Maudslay's engine, should pretend to condemn our physical science. *We*, forsooth, to set the Greeks right in taste! This is teaching our grandmother indeed!

New St. Pancras (which was erected at an expense somewhat exceeding that of the seven most costly of Wren's churches) is the type of these curious monuments; and was meant to represent the Athenian triple group of temples to Minerva Polias, Erectheus, and Pandrosus; but with the former enlarged sufficiently to hold a preaching-room; with the two latter (as they are mere ornamental excrescences) made to correspond; with the addition of a steeple dressed with columns from the porch of another Athenian building; and with the omission, of course, of the sculptures, except those subordinate carvings (meant as a supporting accompaniment) which, from their repetition, admitted of being cast by the hundred in artificial stone. These attracted much attention during its erection, but a London atmosphere destroys all the illusion of Grecian scenery in a few months. It is to be regretted that the open air should have been chosen for such an exhibition (cramped, too, by the requirements of a modern building), and so much stone spent in showing us what might have been both far more perfectly and more permanently displayed by a little canvas and paint. The interior is treated as in the rest of these structures. The discredit of all these edifices is unjustly given to their architects. For all the shams about them we are indebted to the Greeks, and for all the realities to the joiners.

Nearly cotemporary with this, the most extravagant of the pseudo-Grecian buildings, was new St. Luke's, Chelsea, one of the first of the pseudo-Gothic, and the most costly of them in London, excepting, perhaps, that lately finished by the liberality of a single individual, in Rochester Row, Westminster. Between the erection of the first and the last, there have been considerable changes of fashion; improvement, of course, in the correctness with which details are imitated; and also a general tendency to recede from the latest to the earliest varieties of Gothic; chiefly from a most mistaken notion that the earlier and simpler are more capable of being cheapened to meet modern parsimony, forgetting that a main element of their *simplicity* is their real pretenceless elaboration; forgetting, too, their lofty, noble, and *costly* proportions, for want of which our humble imitations (retaining the exact forms of the old roofs) are recognised at once by the intensely shabby peculiarity of being nearly *all* slated roof; not the only peculiarity that, while thought too mean in a stable, is considered appropriate to temples. Another most marked feature of the latest fashion is what may be called the *disuniting* or *patch-work* principle, which we confidently affirm to be the greatest novelty that has ever appeared in architecture. It is carried out by breaking the exterior into as many parts and as irregularly grouped as the internal unity of purpose will possibly permit, and making no two of equal height, or with any horizontal correspondence of their lines; for such correspondence (which was always hitherto practised in all temple-building) is sure to give an idea of *unity*, which is the very reverse of what we want. Two reasons may be found for this: 1st, because it is notorious that the structures most favourable to the painter's art are ruined or patched ones; and hence when this art became more flourishing than architecture, and the difference of a better or a worse *building* was considered of less moment than whether it would make a better or a worse *picture*, these picturesque qualities (of patchiness, dirt, irregularity, &c.) came to be esteemed in stone as well as on canvas, and (being inconvenient in other structures) to be, by a sort of inverse symbolism, specially consecrated to the house of the Holy, Undivided, and Equal. In furtherance of which principle, we would suggest that every new church should have its officers selected from the most picturesque cripples to be found, and that no sexton be without a wooden leg. But, 2ndly, it may be traced to the nature of modern art, which, as we have seen, is representative or deceptive, and has its merit measured by the difficulty of the representation, or rather the difference of the thing represented from that which represents. Hence it is an object that old things should look new, and new, old; that many littles should pass for one great, and one great for many little. A row of houses, being several and mean, how can art be shown but in making them appear one palace? So also a church, being one thing and naturally uniform, must be made to seem multiform and a group of things. Otherwise, where would be the *art?*—where the *deception?*—for these words are synonymous in England.

Descending from the whole, to the two great divisions or classes of parts, those of use and those of ornament (or those to be concealed and those meant to conceal them), we find the two systems quite as independent, as mutually adverse and jarring, in this present fashion, as in any former one, or rather more so; while the loss is much more on the side of the realities (sacrificed to the disguises) than it ever was before. Indeed, the long exhausting war between the two parties of architectonic members, the disguisers and the disguised, seems now turning quite against the latter, to judge from the number that have disappeared, the piteous appearance of the few that dare show themselves (galleries for instance, now vastly more clumsy and ugly than even in the Georgian or Bricklayers' era); and the overgrown triumphant air of their antagonists; frequently, half the ground, and more than half the money, being shared between a bell-less belfry that, at one end

> "Like a tall bully, lifts the head, and lies,"

and a sham Lady-chapel, that, at the other end, serves to make part of the service inaudible; there remains not enough of either material to make the pitiful nave between them hold its small appointed number without these hideous remedies.

On the whole, while the imitation of the peculiarities of plan in the mediæval Romish churches (or rather groups of chapels)—generally carried to an exaggerated degree of disunion, lengthiness and incompactness—prevents any of these structures (whatever their intended capacity) from really serving for more than about 500 hearers (thus rendering about six churches necessary where one might suffice), the superfluities required only for the purpose of disguise (as sham belfries and steeples, mock-chancels, mock-buttresses, &c.) are more vast, cumbrous, and costly than any employed before (even in the Grecian sham temples); so that few, even of those adverse to mediævalism, have any idea of that which perhaps is the only circumstance capable of putting an end to this evil, the prodigious *expense* of this most refined and elaborate mode of disgracing ourselves and dishonouring Heaven.

List of Churches and Chapels built in the Diocese of London by the Commissioners for building New Churches.

Parish or Place.	Style of the Building.	Accommodation.	Estimate.	Cost.
Stepney	Gothic	1338		£
Westminster, St. James	Grecian Doric, with cupola	1500		
Chelsea, St. Luke	Gothic, with tower and porches.	2005		
Hackney	Doric, with portico and cupola.	1828	16,500	15,302
Marylebone (Wyndham Place)	Ionic, with portico and tower	1828	20,000	18,746
Marylebone (Langham Place)	Grecian, the lower order Ionic, the upper Corinthian. Portico and spire.	1761	19,514	17,633
Old Street, St. Luke	Roman Ionic, steeple and portico.	1608	15,065	12,853
Pancras (Regent Square)	Grecian Ionic, with portico and tower.	1832	16,528	16,025
Pancras (Somers Town)	Gothic, with tower and pinnacles.	1985	14,291	13,580
Marylebone (Stafford Street)	Roman, of the Ionic order, with portico and cupola.	1844	19,743	17,872
Hanover Square (St. George, Regent Street).	Ionic, of the temple of Minerva Polias at Prieni, two belfries, portico, and cupola.	1580		
Clerkenwell	Gothic, with tower	1622	14,383	14,350
Hanover Square (St. George, South Audley Street).	Grecian Ionic, with turrets	1500		
Hanover Square (St. George, Pimlico).	Grecian	1657		
Marylebone (Portland Road)	Gothic	2000	23,800	
Shoreditch (Hoxton)	Grecian Ionic, with tower	1732	14,920	14,270
Shoreditch (Haggerstone)	Gothic, with tower	1700	12,998	12,980
Bethnal Green	Grecian, with tower	2000	17,309	
Chelsea (Hans Town, Sloane Street).	Gothic, with two small towers and spires.	1402	7,025	5,849
Edmonton (Winchmore Hill)	Gothic, with bell turret	560	4,306	3,843
Hanover Square (St. George, North Audley Street).	Grecian Ionic, with turrets	1610		
Holborn (St. Andrew, Saffron Hill).	Gothic, with turret and vaults	1783	10,490	9,004
Highgate	Gothic, with tower and spire	1557	8,000	8,330
Kensington (Brompton)	....	1250		
Marylebone (Portland Road)	Grecian	2000	21,829	21,525
Old Street, St. Luke	....	2000		
St. George in the East (Watney Street).	Norman, with two towers	1249	5,685	6,028
St. Martin in the Fields (Burleigh Street).	Gothic, with turret spire	934	5,534	5,302
Bethnal Green (St. Matthew)	Grecian, with tower	2000	18,003	17,638
Fulham (Hammersmith)	Grecian Doric, with tower	1601	12,975	12,223
Fulham (Walham Green)	Gothic, with tower	1370	9,683	9,669
Islington (Ball's Pond)	Gothic, with tower	1793	11,205	10,947
Islington (Cloudesley Square)	Gothic, with turrets	2009	12,143	11,535
Islington (Holloway)	Gothic, with tower	1782	11,613	11,890

List of Churches and Chapels—continued.

Parish or Place.	Style of the Building.	Accommodation.	Estimate.	Cost.
Kensington (Addison Road)	Gothic, with four cupolas	1330		
Kensington (Brompton).	Gothic, with tower	1505		
Heston, Hounslow	Gothic, with turrets and dwarf spires.	1035	5,310	5,310
Tottenham	Gothic, with four turrets	801	5,250	4,893
St. Botolph, Bishopsgate (Skinner Street).	Gothic	1200	5,578	5,380
West Ham, Plaistow	Gothic, with turrets and belfry.	584	3,735	3,064
Barking, Ilford	Gothic, with tower and spire	851	4,554	3,521
Hampton Wick	Gothic, with lanthorn	800	4,352	4,437
Paddington	Gothic, with belfry	1439	8,529	8,778
St. Giles, Queen Street	Gothic, with turret and spire	1980	9,507	8,831
St. George, Bloomsbury (Woburn Square.	Gothic, with tower and spire	1526	8,140	8,330
Clerkenwell (Sharp Square)	Gothic, with belfry	1106	4,541	4,418
Cheshunt	Gothic, with belfry	572	3,549	3,282
West Ham, Stratford	Gothic, with tower and spire	850	8,745	7,100
Westminster, St. John's (Vincent Square).	Gothic, with steeple	1219	5,000	5,000
St. Andrew, Holborn (Gray's Inn Road).	Grecian, with tower	1524	6,944	7,554
St. Bride's, Fleet Street (Pemberton Row).	Gothic, with tower	1100	4,000	
St. James, Westminster (Berwick Street).	Gothic, with belfry	1545	7,047	
Great Ilford (Barking Side)	Norman, with belfry	466		
Upper Chelsea (Hans' Place)	Norman	1188		
Bethnal Green (St. Peter's Chapel) (Bonner's Hall).	Norman, with tower and spire	1130		
Bethnal Green (St. Andrew's)	Lombard, with tower and belfry	1091		
Bethnal Green (Friar's Mount)	Norman, with two low campaniles.	1112		
Bethnal Green (St. James)	Norman, with tower and spire	1133		
Hanover Square (St. George's) Wilton Place.	Gothic, with tower	1520		
Bethnal Green, St. Bartholomew's Chapel.	Gothic, 13th century	1058		
Paddington	Gothic, with tower and spire	1616		
Westminster (St. Margaret), Broadway.	Gothic	1500	7,893	6,116
Chiswick (Turnham Green)	Early English, with tower and spire.	930		
Chelsea (Kensal Green)	Anglo Norman, with two small towers.	580		
St. Giles in the Fields (Belton Street).	Gothic, with spire	1000	4,459	4,440
Kensington (Norlands)	Gothic, with tower and spire	759		
Rickmansworth (West Hyde)	Norman, with tower	314		
Bethnal Green (St. Jude's Church).	Romanesque, with tower	1000		
Hackney, South	Gothic, with tower and spire	1507	10,879	10,690
Halstead (Essex)	Gothic, with tower and spire	703		
Paddington	Perpendicular Gothic, with tower and spire.	1617		
Hackney, Homerton	Gothic, with tower	607	4,845	4,840
St. Marylebone (Hamilton Terrace), Christ Church district.	Decorated Gothic, with tower and spire.	1454		
St. Marylebone (Wall Street), All Souls district.	Perpendicular Gothic, with tower and spire.	1200		
Whitechapel	Early English Gothic, with tower at south-west angle.	1006	5,436	5,436
Bethnal Green, St. Matthew's, (St. Matthias D.).	Romanesque, with tower and spire.	893		
Paddington (Cambridge Street).	Gothic, with bell turret	1400		
Greenwich, East	Gothic, with tower	1333	5,145	
Islington (Highbury)	Gothic, with tower and spire	732	5,400	
St. Pancras (Camden Road Villas).	Decorated of the 14th century, with tower and spire.	1189	6,837	
Bethnal Green (St. Matthew), district of St. Thomas.	Early English, 12th century	890	4,950	
Hammersmith (Shepherd's Bush).	Gothic, of the 14th century	632	4,941	

List of Churches and Chapels—continued.

Parish or Place.	Style of the Building.	Accommodation.	Estimate.	Cost.
Westminster, St. Margaret, (Ermismore Gardens).	Italian, of the 14th and 15th century.	1308	8,798	
Brompton (St. Mary's Church), West Brompton.	Gothic, of the 14th century	500	2,900	
Charlton District of St. Thomas, Woolwich.	Romanesque, of the 11th century.	841	4,580	
St. Pancras, Haverstock Hill ..	Gothic	1425	9,750	
Westminster (St. John's), Great Peter Street.	Gothic, of the 14th century	1209	7,150	

Her Majesty's Commissioners for building new churches for such parts of England requiring the same, report, July 29, 1850, that in the whole, 470 churches have been completed, and provision made for 498,066 persons, including 291,190 free seats, appropriated to the use of the poor, and, additionally, that 32 churches are now in the course of building. Of Protestant Episcopalian Chapels there are 84.

Of Baptist Chapels there are 69; of Independents, 79; of Irvingites, 3; New Christian or New Jerusalam Church, 3; Scotch Church and Scotch Secession, 13; Wesleyans, 46; of other Dissenters there are 31 Chapels.

Roman Catholic Churches and Chapels in London and Vicinity.

THE CITY.

St. Mary's, Moorfields.
St. Boniface, Great St. Thomas Apostle, Bow Lane, Cheapside.

EASTWARD.

St. John the Baptist, Hackney.
SS. Mary and Michael's, Ratcliffe Highway.

CENTRAL.

Sardinian Chapel, Duke Street, Lincoln's Inn Fields.
SS. Peter and Paul's, Upper Rosamond Street, Clerkenwell.
St. Patrick, Sutton Street, Soho.

WESTWARD.

Bavarian Chapel, Warwick Street, Golden Square.
Spanish Chapel, Spanish Place, Manchester Square.
French Chapel, Little George Street, King Street, Portman Square.
Farm Street, Berkeley Square (Jesuits).
St. Philip Neri, King William Street, Strand.

WESTMINSTER.

St. Mary's, Romney Terrace, Marsham Street.

WESTERN VICINITY.

Chelsea Chapel, St. Mary's, Cadogan Terrace, Sloane Street.
Kensington, Holland Street.
Hammersmith, No. 8, King Street.
,, Brook Green.
,, Convent of the Good Shepherd.
Acton Chapel.
North Hyde, near Southall.—St. Mary's Orphanage.
Isleworth, Shrewsbury Place.
Fulham.—St. Thomas of Canterbury.

NORTHERN VICINITY.

Our Lady's Church, St. John's Wood, Grove Road.
Hampstead.—St. Mary's, Holly Place.
,, Poplar House.
Kentish Town.—St. Alexis, Gospel Terrace.
Somers Town.—St. Aloysius, Clarendon Square.
Islington.—St. John the Evangelist, Duncan Terrace.
Walthamstow.—St. George's.

EASTERN VICINITY.

Poplar.—St. Mary's, Wade Street.
Isle of Dogs.—Mill Wall, St. Edmund's.
Bermondsey.—Church of the Most Holy Trinity, Parker's Row, Dockhead.

*** The Catholic population attached to this church is above 9000.

Stratford.—SS. Patrick and Vincent de Paul's.
Tottenham.—St. Francis de Sales' Chapel, Chapel Place, White Hart Lane.

SOUTHERN VICINITY.

St. George's Church, St. George's Fields.

The Southwark Catholic charity schools are under the spiritual directions of the chaplains, who have also to attend Guy's and St. Thomas's Hospital, the Queen's Bench, Surrey, Marshalsea, and Clink prisons, and many large workhouses.

St. Mary and St. Michael, Virginia Street, St. George's Street.

Webb Street Chapel, Southwark.
Wandsworth.—St. Thomas of Canterbury.
Norwood Chapel.
,, Convent of our Lady.
Wimbledon Chapel.
Barnes Chapel.
Mortlake Chapel.
Richmond.—St. Elizabeth, Vineyard, Surrey.
Clapham.—St. Mary's Chapel.
Kingston-on-Thames Chapel.
Deptford.—Church of the Assumption.
Greenwich.—Clarke's Buildings, East Street, Maize Hill.
Woolwich.—St. Peter's, New Road.
Total number of churches and chapels in the London district, 48.
Population of the several denominations, 4,101,806, including Middlesex, Berkshire, Hampshire, Hertfordshire, Essex, Sussex, Kent, &c., corresponding with very nearly the Protestant diocese of London.

Foreign Christian Churches.

Danish and Foreign Sailors', Well Close Square.
Dutch Reformed Church, Austin Friars.
French Protestant, St. Martin's-le-Grand, near the General Post Office, and Bloomsbury Street.
German Catholic Church, Great St. Thomas Apostle, City.
German Lutheran, Great Trinity Lane, City.
German Reformed, Hooper Square, City.
German (St. George), Great Alie Street, Goodman's Fields.
Greek Church, London Wall, between Nos. 81 and 84.
Italian Protestant, Dufour Place, Golden Square.
Royal German Lutheran, Marlborough Court Yard, St. James's Place.
Russian Greek Church, 32, Welbeck Street.
St. Mary Lutheran Church, Savoy St., Strand.
Swedish Protestant Church, Prince's Square, Ratcliffe.
Swiss Presbyterian, Moor Street, Soho.

Of Jews' Synagogues there are 7. (See article " Jews in London.")

COLLEGES.

Arms (College of), Doctors' Commons, near and on the south side of St. Paul's Cathedral, a very ancient corporation, comprising 13 gentlemen, 3 kings at arms, 6 heralds at arms, and 4 pursuivants at arms, appointed by the Earl Marshal of England, and holding patent places. The duties of this office are to record the genealogy and heraldic arms of all those families known and collected in the several visitations made from time immemorial in all parts of the kingdom, and likewise the pedigrees and arms of noble and baronetal families carried down to the present day. For the ordinary search of the records, the fee is 1*l.*, and for more than one search, also 1*l.* 1*s.* Fees for a new coat of arms, 10*l.* 10*s.*, or more.

Chemistry (Royal College of), No. 16, Hanover Square, founded 1845; its purpose, the establishment for the promotion of the study of practical chemistry, with a well-appointed laboratory. Fees for the session, daily attendance, 15*s.*, four days in the week, 12*s.*, three days, 10*s.*, two days, 7*s.*, and one day in the week, 5*s.* See "Learned Societies."

Independents (College of), New College, London, for religious and secular education. The endowments are appropriated to the instruction of non-resident students, preparing for the Christian ministry among Independent churches. It has been instituted under the provisions of an Act of Parliament, sanctioning the union of Highbury, Homerton, and Coward Colleges. The buildings, which are situated about half a mile north of Regent's Park, are of Bath stone, and built in the English collegiate style, from designs furnished by J. T. Emmett, Esq. The total length of the front is 270 feet. The main building contains lecture rooms, council room, laboratory, museum, and students' day rooms. At the north end is the residence of the principal; at the south, a library, containing about 20,000 volumes. The central tower, which is 80 feet high, commands a most extensive view of the metropolis and surrounding country.

King's College and School, east wing Somerset House, Strand. See article, " Learned Societies," also p. 63.

London University College, or University College, Upper Gower Street, Bedford Square. See article, " Learned Societies," also p. 63.

Gresham College, in Basinghall Street, originally established by Sir Thomas Gresham in Broad Street, subsequently re-established in the building of the Royal Exchange, instituted for the delivery of lectures in divinity, civil law, astronomy, music, geometry, rhetoric, and physic. The first lecture was delivered in 1597. The lectures are delivered during the law terms.

Physicians (College of), Warwick Lane, Newgate Street, erected by Sir Christopher Wren, in 1674, and finished in 1689, now in disuse.

Physicians (Royal College of), in Pall Mall East, Trafalgar Square, built by Sir Robert Smirke, architect, at an expense of 30,000*l.*, and opened by Sir Henry Halford, June 25th, 1825. See article, " Learned Societies."

Surgeons (Royal College of), Lincoln's Inn Fields, on the south side of, built, and afterwards improved, at a cost of near 40,000*l.*, by Mr. Chas. Barry. See article, " Learned Societies."

Sion College, London Wall, was founded by the Rev. Thos. White, in 1623, for the use of the London clergy, with free access to the extensive library. To this library all publishers were formerly compelled, by Act of Parliament, to contribute a copy of each of their publications. There are several portraits in the hall and library. Almshouses are endowed for twenty poor persons, and in the lower part of the same building.

Doctors of Law (College of), Bell Yard, Doctors' Commons, incorporated in 1768, of which there are thirty D.C.L's. Mr. H. Watts, under treasurer.

Dulwich College, founded by Edward Alleyn, 1619. Master must always be of the name of Allen, or Alleyn. The present master is Geo. J. Allen, Esq., M.S. See article, " Gallery of Pictures."

East India College, established in 1805, at Harleybury, Hertford, consisting of a visitor, principal, dean, registrar, and ten professors. Visitor in the Oriental department, Professor H. H. Wilson, M. A.

Morden College. See "Almshouses."

St. Peter's College, Dean's Yard, Westminster, founded by Queen Elizabeth, in 1560, for 40 foundation or Queen's scholars, from six to ten years of age. Dean, W. Buckland, D.D. Eight masters.

Royal Veterinary College, founded in 1791, by Mons. Chas. St. Bel, a French professor of veterinary art, for the study of Diseases incident to the Horse, and for the improvement of farriery generally, and a pharmacy for medicine. The building is extensive, and well situated, in St. Pancras, Camden Town.

There are also the colleges for educational and professional purposes—as Hebrew College; Addiscombe; Sandhurst; Woolwich; Converted Jews' College, Hackney; St. Bartholomew's; St. Thomas's; Putney; College for Ladies; College of Preceptors, Bloomsbury Square, &c.

CONCERTS.

See Article "Music."

Concert Rooms are in all parts of the town. Concerts are held at the principal hotels, &c.; also in the large rooms of the several theatres, especially those of the most fashionable.

At the Italian Opera House, in the Haymarket, which is very handsomely fitted up, concerts and balls are held.

Also at Almack's (sometimes called Willis's Rooms), King Street, St. James's. Built by Robert Mylne, Architect.

Exeter Hall.—Concerts are held here during the spring and summer months.

Queen's Concert Rooms, Hanover Square.—The concerts of the Philharmonic Society and of the Ancient Concerts are held here; likewise the concerts of the Royal Academy of Music. The great concert room is beautifully decorated, 90 ft. by 35 ft., and will hold 800 persons. The panels of the ceilings are decorated with the paintings of Cypriani.

At The Royal Academy of Music, Tenterden Street, Hanover Square, incorporated by royal charter, expressly for the cultivation of musical science.

Concerts are held also at the Argyle Rooms, Argyle Street; Freemasons' Tavern, Great Queen Street; Crown and Anchor, Strand; City of London Tavern, Bishopsgate Street; Albion, Aldersgate Street. Concerts are likewise given at the Mechanics' Institution, Southampton Buildings, Holborn, and other places of spacious accommodation.

CONVERSAZIONES.

It is one result of London being the chief seat of the professors of science, that it provides numerous occasions for their reunion; but the assemblages called Conversaziones are almost peculiar to the metropolis. Besides the celebrations which take place in the day time, and besides dinners, the Conversaziones give each class of men of science the opportunity of associating together. The invitations for these meetings are given by the presidents of the several societies, and are extended to the members of their own society, the professors of the sciences having any connection with it, and the leading personages in the worlds of literature, science, art, and politics. Refreshments are provided, and objects of interest are contributed, by the friends of the president for the amusement of the visitors.

The Conversaziones of the President of the Royal Society may justly be placed at the head, as they are the means of bringing together, not the votaries of one branch of study, but the whole world of science. The latest inventions, the newest discoveries, illustrated by models and drawings, are brought under the consideration of the visitors, and they present the opportunity of being discussed by some of the most eminent men. Nor is it merely a technical consideration which is given to these subjects, but very often some valuable economical inventions, some new means of propulsion, or some new telegraph, is brought under the immediate notice of the leading political personages, who are most interested in its promotion. Distinguished and learned foreigners, receiving explanations from the authors, spread abroad a knowledge of these inventions and discoveries, and extend the reputation of those by whom they are made.

The Institution of Civil Engineers has commonly, by the hospitality of its president, been favoured with two or three Conversaziones yearly, but sometimes there is only one. The arrangements are under the direction of Mr. Manby, the secretary, and wherever given, the taste and skill of their manager make them among the most agreeable and most important of these reunions. When held in the house of the institution, in Great George Street, the apartments are arranged, *en suite*, so as to give the greatest means for comfort and display; and to those unaccustomed to these scenes, they are the more attractive as exhibiting in their visitors and in the fittings the intellectual resources of a great metropolis. The model room is the peculiar feature. There are to be seen working models of the newest machinery, and the greatest works of engineering, and an opportunity is presented for their examination and review. A book has great advantages in its descriptions and its drawings; but in the model room are not only drawings, but models, and not only these at work, but the engineer present who has constructed them, and the living experience of his brethren, to whose judgment they are submitted. It is not surprising this celebration is a favourite resort of the most eminent statesmen. But though the model room is thus occupied, the fine arts are not neglected, and the walls present a gallery of works by great living masters, while on the tables are portfolios of original drawings, with busts, bas-reliefs, and sculptures. Thus side by side are brought the most material and most imaginative works and their professors.

The President of the Institute of British Architects gives, in his mansion in St. James's Square, a similar reunion to the architects, and many interesting drawings are there displayed. The physicians are assembled in their college at Charing Cross, by their president.

The meetings of many of the societies are in the nature of Conversaziones. After the scientific business of the meeting has been concluded, the fellows and visitors adjourn to the library and museum; tea and coffee are served round, the proceedings of the evening are further discussed, some object of interest placed on the tables or to be found in the collection is examined, strangers are introduced to the leading men of science, and the party breaks up at a late hour, looking forward to the next occasion of reunion. Such are the meetings of the Royal Society, the Antiquarian, the Geological, the Ethnological, the Institution of Civil Engineers, and the Institute of British Architects.

The Society of Arts usually devotes some few evenings in the year to assemblies, when ladies are invited, the galleries lighted up, and the objects of exhibition are thrown open to the inspection of the circles of literature and fashion.

The Lord Mayor Musgrove announced, in 1850, that he would, in the year of the Great Exhibition, hold Conversaziones, to which men of science and foreigners should be invited.

The British Institution have likewise evening meetings to which their members are privileged to bring ladies, and where the artists have the opportunity of conversing with the patrons of art, on the works contributed to the gallery. It is much to be regretted that there are not more of these evening exhibitions of art, bringing the artist more in communion with the literary world.

The Royal Institution and the London Institution give a number of evening meetings, to which ladies are likewise admitted, and at which some subject of interest is illustrated by an eminent man of science. After the paper or lecture is finished, the company take refreshments, and inspect the various objects of art and science exhibited in the rooms. The City of London Institution, and the Whittington Club, give occasional Conversaziones.

This class of evening meetings, to which ladies are admitted, and which is of a more popular character, has had great influence in interesting the public in the progress of improvement, for there is a rivalry for distinction among the managers of the societies, and inventors readily avail themselves of such opportunities of making their labours known. The stranger will see, that great as is the power of the press in spreading knowledge, there are other and not less effective ways of influencing the public mind. Among the features of a vast metropolis those are not least interesting which illustrate the causes of its moral influence on the country and the world at large. It is not only that by masses of men being drawn together on one spot, the means for forming various institutions are provided, but it is that a vast moral organization is constituted, by which the public mind is agitated, influenced, and inspired.

The opening of some of the medical colleges, as St. Bartholomew's, is generally attended with an evening meeting. The inaugural lecture is read in the theatre, and the professors, students, and old members of the college meet together in the museum, where objects of professional interest are displayed.

The Conversaziones of the Royal Botanic Society differ from all the others, in no refreshments being provided, and as being held in the afternoon, and partly in the open air, the conservatories and gardens being the place of meeting. Not only scientific, but economical botany is the subject of illustration, and many interesting applications of vegetable substances are shewn, as well as drawings, carvings, and models of flowers. Ladies are invited.

THE CORPORATION OF THE CITY OF LONDON

Is constituted in a peculiar manner, and is one of the few remaining of the great town commonwealths and federal institutions of the Middle Ages. Within the last twenty years, the old local institutions throughout the country have been restricted or abolished by general measures of centralization; but in the City of London, as at the time of Domesday, the citizen still has the government in his own hands, and the head of the State has only a local jurisdiction. Even the parliament of the three kingdoms acknowledges in a distinctive manner the independent existence of the City.

In the City alone are to be found many of the old English customs brought from the meadows of Jutland, and, although having many Norman and later modifications, the ground-work of the constitution is English, or what is sometimes known as Anglo-Saxon.

On the inroad of the English tribes, and on the Welsh being driven out from the Roman towns, London was burned to the ground, as all the excavations show, and the new English population was too scanty to fill the space within the vast walls; so that, not only were cattle fed among the Roman ruins, but the barrows of the leaders elsewhere at a distance from the homesteads, were within the circuit. Such were Aldermanbury, Bucklersbury, and Lothingbury (Lothbury). The space within the walls was shared out in marks, or wards, to which additions were afterwards made. In each of these wards an alderman was chosen. At a later time, these wards were further shared out into what are now called precincts.

The precinct is the same as the township or parish elsewhere, the ward is the hundred, and the city a shire, folkland, or commonwealth. At the present time the precinct commonly has its common-councilmen, its inquest-men, clerk, beadle, constable, or headborough, overseers of the poor, and tax collectors, as well as its church establishment. As elsewhere, the precinct or township and the parish have not always the same bounds or jurisdictions, though commonly they have. In some parts, too, the precinct jurisdiction is not kept up, or is merged with the parish. The ward has an alderman, the several common-councilmen (of whom one is deputy alderman), a full inquest, ward clerk, and ward beadle. The city has its Lord Mayor, Court of Aldermen, Court of Common Council, Sheriffs, and other chief officers.

A few days before St. Thomas's day, in each year, that is, before Yuletide, a meeting is called for the precinct, which is perhaps only half a street, and to which all indwellers, whether citizens or not, that is, all above fifteen years old, can come and speak. At this precinct meeting, the doings of the officers of the last year are gone into, and a new roll of officers is drawn up. The number of inquestmen sent by each precinct is enough to make up for the whole ward an inquest of not less than sixteen. The inquestmen are taken in turn, from a roll of the householders, and are not necessarily citizens. The common-councilmen, constables, beadle, and collectors are not now taken in turn, but those are named who are thought most fit.

On St. Thomas's day the wardmote, or meeting of all the citizens of the ward is held, when the alderman takes the chair. He is in his robes, wearing a gold chain, and attended by the ward beadles with silver or gilt maces. One of these latter makes proclamation in the following way:—"Oyez! Oyez! All ye good men of the ward draw nigh, and attend to the business of the ward." A precept is read from the Lord Mayor, commanding certain elections to be made. The precinct returns of inquestmen are then read, and commonly confirmed. The new inquestmen are then called to choose a foreman, and are forthwith sworn before the wardmote to do their duty. The precinct returns for common-councilmen are read, but any other candidates can be put up. The names are put to a show of hands, or in case of dispute a poll is taken. The business of choosing other officers, examining the accounts of the ward rate, and giving thanks to passed officers, is proceeded with, and the ward beadle makes proclamation, "Oyez! Oyez! All ye good men of the ward depart hence and go ye to your homes. God save the Queen."

The inquest meet together at the ward house or inquest room, and divide themselves into committees for the discharge of their several duties, which include the inspection of weights and measures, and of public houses; the removal of nuisances, the indicting of houses of ill fame, and the prosecution of non-citizens for trading within bounds; and generally the watching over the interests of their ward. At an early day the inquestmen, in their furred robes, proceed in divisions, each having its foreman, treasurer, and secretary, and attended by a beadle, to collect funds from the inhabitants for charitable distribution. These funds are partly given to poor residents, but partly to respectable persons, who, having formerly lived in the ward, have fallen to decay. Thus, many poor tradesmen and widows are relieved. Inquestmen not attending to their duties are fined, and these fines go in part payment of a dinner, to which the alderman and other authorities are invited.

On Plough Monday, the Monday next after Twelfth-day, the inquests go up in their furred gowns to Guildhall, where the Court of Aldermen is sitting, and make their presentments of the common-councilmen chosen, and of the several matters in which they desire the action of the community, as in the removal of nuisances beyond their power, or in the prosecution of offenders. Any inquestman dissenting from a presentment, can address the Court.

It will be seen that two English principles are carried out, one, that each fraction of the population is represented; and another, that where it can be done, each citizen must serve personally and in turn.

The citizens exercising the franchise within the wards are, since 1849, those on the parliamentary voters list who are freemen of London. The citizens exercising the franchise for Lord Mayor, Sheriffs, &c., are freemen of London, being liverymen of some one of the companies or trade corporations.

Each son or daughter of a freeman of London, born while the father was free, is entitled to take up the freedom at the age of twenty-one. These freemen by birthright are very many, and some have inherited their freedom during several generations. Most members of the peerage are thus citizens of London. On payment of a very small fee, persons of any sect being of

English birth, and carrying on business within the city, are allowed to become free. Most of the citizens are likewise free of a company, and their apprentices are likewise entitled to become citizens. The magistrate who admits and swears in the citizens is the Chamberlain, or Treasurer of the City, who holds his chamber or court in the Guildhall, and who exercises magisterial jurisdiction over the apprentices. The court is open, and commonly every day about noon, the admission of some citizen or apprentice can be seen.

The number of trade companies is about ninety, twelve of which are called the great companies, and are first in honour and state. These twelve are the Mercers, Grocers, Drapers, Fishmongers, Goldsmiths, Skinners, Merchant Tailors, Haberdashers, Salters, Ironmongers, Vintners, and Clothworkers. Other considerable companies are the Leathersellers, Saddlers, Carpenters, Weavers, Stationers, Apothecaries, Spectaclemakers, Clockmakers, Coopers, Tallowchandlers, and Wheelwrights. These several companies will be described hereafter: for the present it is enough to explain, that those following a trade within the city mostly belong to the company of that trade; but the great body of the freemen of each company being so by birthright, are not necessarily mercers, or cooks, as the case may be. Of the freemen of each company, some 200 or 300 of the more considerable are made liverymen. The liveryman of London should be worth not less than 1000*l.*, and must be a master and not a servant or journeyman. On state occasions he wears a gown of the livery of his company. The livery, whether dwelling within the city or not, vote for Lord Mayor, Sheriffs, Chamberlain, Bridgemaster, and Auditor of the City Accounts; and the livery dwelling within seven miles vote for Members of Parliament. The liveryman pays a fine or fee of admission, commonly of about 20*l.*, which goes to a fund for providing dinners. The livery of some companies have several banquets within the year, to which each can invite a friend. A meeting of the livery of the whole city is called a Common Hall.

A citizen of London living within the city, besides his corporate share of its immunities, is free from tolls and customs through all England, and parts of the sea; he cannot be pressed for the sea service (wherever resident), nor be ballotted for the militia; he has the exclusive privilege of carrying on retail trade, and is free from toll on his carts and goods, at the gates. Among his privileges (now of little value) is that of hunting in Middlesex. The citizens are very particular in giving offices and patronage only to those who are free. The widow of a freeman is free and privileged, and his orphans have the right of placing their property in the Chamber or Treasury of the city, at 4 per cent., whereby they become wards of the Court of Aldermen.

The freedom of London is one of the honours granted to public men. The freedom is conferred by vote of the Corporation, and on some public occasion the new citizen is received by the Chamberlain. In the Chamber are to be seen, richly illuminated, copies of the votes of thanks given to the great statesmen and captains of the present century.

The City of London forms two portions: London within the Walls, and London without the Walls. London within the Walls is the most ancient part, within the Roman walls; the other part consists of the suburbs or liberties formed in the Middle Ages, without these walls. Of the walls few remains exist; but it is worth while to refer to the boundary, as it will assist the archæologist in determining the site of the Roman settlement, and will enable him to follow historically the growth of the city. The boundary of the old city is very nearly that of the great fire of 1668, and, consequently, within those limits, the architecture is not earlier than Wren's time, and it is on the bounds we must look for mediæval monuments. Temple Bar, an outer bar in the liberties, is the only remaining gateway, and by which is the state entrance for the King or Queen. On such an occasion the gates are shut to, and the authorities drawn up within on the city side. A herald, or other officer of the King, knocks at the gate, and informs the Marshal that the King asks admission. The Marshal reports this to the Lord Mayor, who gives orders that the gate shall be thrown open, and proceeds to offer the king the city sword. The gate is sometimes strictly kept, for the Lord Mayor being within his bounds second to the King alone, is jealous that his precedency of other great personages is preserved. Troops arriving at the city bounds must not pass through with drums beating, or colours flying, or recruit, unless with leave of the Lord Mayor, one regiment only excepted, the Old Buffs, who were originally raised within the city; and who, when in England, are always welcomed in the exercise of their privileges. At the bars of the city without the Walls, as at Temple Bar, Holborn Bar, and Smithfield Bar, officers of the city may be seen levying toll on the carts of all nonfreemen, that is, all carts not marked with the city arms, the red cross of St. George, and the dagger.

The wards of the city are twenty-six, for each of which there is an Alderman (except the two wards of Cripplegate, which are joined), and one for the Borough of Southwark, or Bridge-without, which is for certain purposes within the city jurisdiction. Five large wards, Aldersgate, Bishopsgate, Cripplegate, Farringdon-within, and Farringdon-without, are subdivided and have each a separate deputy-alderman. The number of parishes is 110; the number of precincts is not well ascertained.

The style of the corporation is the mayor and commonalty and citizens of London, and the head of this is the Lord Mayor. This officer is chosen by the Livery, on the 29th of September, being commonly the senior alderman, who has been sheriff, but not Lord Mayor. The office is seldom given twice. The Common Hall name two aldermen, and the Court of Aldermen claim the right of choosing the one to be mayor. The forms of the elections are peculiar.

The Lord Mayor Elect goes in procession to be presented to the Lord High Chancellor, who signifies the assent of the Government to the election. On the 8th of November, the Lord Mayor is sworn in before the Court of Aldermen, invested with the golden collar of SS. and jewel, and signs a bond for 4000*l.* to restore the plate and jewels of the office, which are however worth 20,000*l.* These two ceremonies are worth seeing. The grand day is the 9th of November, kept as a city holiday, under the name of "Lord Mayor's Day." Business is suspended in the principal thoroughfares, and in the afternoon the whole population are let loose. During the passage of the procession, the City officers close the streets against omnibuses and other carriages. In the morning the Lord Mayor breakfasts at Guildhall with the Court of Aldermen. About mid-day he sets out from Guildhall with a procession, which includes the late Lord Mayor, the Court of Aldermen, sheriffs, and City officers in their carriages, bands of music, pageantry, and the households of the Lord Mayors. These are attended by processions of the companies to which the Lord Mayors and sheriffs belong; and in honour of the dignitary of their company, the master, wardens, and Court of Assistants, dressed in their robes, follow in their carriages with music, and with banners borne by their watermen and pensioners, dressed in uniform and armed. On extraordinary occasions, all of the great companies attend in state, and swell the procession. At one of the bridges or other waterside stair, the company take water in the barges of the city and great companies. These are richly gilt and carved barges, with banners flying on the roof, and having a band of music on board. They are sometimes rowed by watermen, but most commonly towed by steamers. This is one of the few water processions in Europe, and on a fine day and during a liberal mayoralty, has a good effect seen from the river or one of the bridges. During the voyage the authorities amuse themselves with luncheon. On arrival at Westminster, the Lord Mayor lands with his immediate suite, and enters the Court of Exchequer in Westminster, where he is presented to the barons, and takes an oath of office. By the mouth of his own judge, the Recorder, he invites the Judges in the several courts to dinner. During this time the barge of the Stationers' Company goes to Lambeth Palace to present the Archbishop of Canterbury with copies of the Company's almanacks. The company return by water to Blackfriars'-bridge, where a grander procession is formed, and which at the foot of Ludgate-hill receives the addition of the Lady Mayoress, the Princes, Ministers of State, Judges, and Foreign Ambassadors. The houses in the line of procession are decorated with flags, and filled with company, who are feasted by the citizens. The morning procession is through the ward to which the Lord Mayor belongs; the afternoon procession from Blackfriars-bridge, through Ludgate-hill, Ludgate-street, St. Paul's-churchyard, Cheapside, and King-street, to Guildhall. Some few houses are let on this occasion, and strangers can obtain seats at various prices to view the procession, if they prefer avoiding the crowd in the streets. Guildhall is decorated and illuminated inside and out by the City architect, as becomes a great occasion; and a magnificent banquet is laid within the hall. This is the inauguration dinner of the Lord Mayor and sheriffs, who with the City furnish the expenses. The guests are the members of the Corporation, and their wives and friends. Each member of the Corporation has tickets to give away. The King or Queen sometimes dines with the City on this occasion, and all strangers of importance are invited. A minister of the Crown always attends, as this is a suitable occasion to keep up sympathy with the Corporation, and to appeal to public feeling. The observances of the dinner are like those of other City dinners.

The Mayor of the City of London is styled Lord, and Right Honourable, holds within the City the first place after the King, and on the occasion of the death of the King is one of the great functionaries summoned to the Council, where he has signed first the declaration of the title of the new King. He presides in the Court of Aldermen, Court of Common Council, Central Criminal Court, Lord Mayor's Court, and Common Hall; is a Judge of the Criminal Court, Justice of Peace for the neighbouring shires, and has the nomination of other Justices; he is Lord Lieutenant, and at the head of the military force of the city; he is Admiral of the Port of London, and Conservator of the Thames from Staines Bridge to Yantlet Creek, and of the Medway from Colemouth Creek to Cockham Wood. In a general assessment in 1377, he was assessed as an earl, and at the coronation of a King attends as Chief Butler, and receives a golden cup as his fee. He resides in the Mansion House, which is fitted up as a palace for his reception, has the use of the City plate, furniture, state carriage, barge, officers and servants, and receives a stipend; but his own further disbursements often exceed 4000*l.* a-year. The whole expense of the office may be reckoned at 15,000*l.* a-year. The common crier, the water bailiff, and the sword-bearer, are esquires of his household, and commonly act as his chamberlains and secretaries, assisting in the arrangements of his banquets and state festivals.

On state occasions, the Lord Mayor is dressed in a knotted gown, like that of the Lord Chancellor; when preceding the Monarch, a crimson velvet gown; on occasions of less importance, a scarlet cloth gown, or one of mazarine blue silk. When not in robes, a golden chain and badge is nevertheless worn. The Lady Mayoress partakes of the state of her husband. In case the Lord Mayor is not married, the Lady Mayoress is some female relative, or the wife of another alderman. It is customary on certain public occasions, as a royal visit to the city, or great public event, to create the Lord Mayor a baronet, and the sheriffs knights.

The Lord Mayor is expected to keep up the hospitality of the city by giving balls and dinners at the Mansion-house, to the members of the corporation, their wives and children, and to the several public authorities and persons of eminence. Admission to these celebrations can be obtained through members of the corporation. The Egyptian-hall and the inside of the Mansion-house are worth seeing on such occasions, as likewise the princely state of the chief magistrate, which, in the middle ages, was common to every great dignitary.

The Lord Mayor's state carriage, built in 1757, is worth seeing. This and the Queen's state carriage are the only remaining specimens of the pompous vehicles of the last century. It is richly gilded, and the paintings, which are in a superior style, are illustrations of a former branch of high art-coach-painting. They are by one of the original Royal Academicians—some say Cipriani, and some Dance. At either window of the carriage sits the sword-bearer, with the sword of state, and the common crier, wearing a fur cap, called the Cap of Maintenance, or City Cap of State, a mark of dignity highly prized in former ages, when princely coronets were run after.

The alderman is chosen for life by the freemen, householders of his ward. He is usually a merchant, or some wealthy tradesman. He is a Judge of the Central Criminal Court, a Justice of Peace for the City of Southwark, and within his ward has the authority of two justices. The junior aldermen are styled Worshipful, but those who have held the mayoralty are styled Right Worshipful, and take precedence of all knights. Within the city, they hold rank next to the Lord Mayor, as barons of the city. The aldermen, when performing their functions, wear robes of state and a gold chain, and are attended by their ward beadles with the maces. As a body, they form the Court of Aldermen, which is the House of Peers, Privy Council, and Senate of the City, and sits in state at Guildhall, presided over by the Mayor, and attended by various officers in their robes. This Court has, in particular, the oversight of the city police.

The Court of Common Council, or City Parliament, consists of the Aldermen and Common Councilmen, presided over by the Lord Mayor. One Common Councilman for each ward is named as deputy alderman, or more shortly deputy, and as such has the title of esquire, and is a deputy-lieutenant for the city. The Court sits at Guildhall in the day time, and much form is observed. The aldermen are on a raised bench near the Lord Mayor, having a sheriff at each end of the bench. At the table are the Recorder, and other officers of the corporation. In the body of the hall are the deputies and Common Councilmen, who only wear their blue mazarine gowns on state occasions. Below the bar are stationed the city marshals and the doorkeepers, and there is a gallery free for strangers. The mode of proceeding and powers of the Court assimilate to those of the House of Commons. The legislative proceedings of the Court are called Acts of the Common Council, and there is full power in the Court to determine the number of its members, the qualification of the voters, and the mode of voting, which elsewhere are determined by the central government, or some general law. Much of the business is transacted by committees, as those for lands, markets, the navigation, &c., or by commissions named by the corporation, as the Court of Sewers, the Irish Corporation, Lieutenancy, &c. These Committees receive an allowance for their attendances, which is appropriated for dinners, to which the members can invite strangers, or for excursions in the city barge on the river, when ladies are invited.

The Courts of Aldermen and Common Council constitute the governing body, to whom is committed the care of the franchises and the general administration of the property of the commonwealth. The franchises of the city arising from the independent rights of the first English settlers, are confirmed by Magna Charta, and several charters and Acts of Parliament. They include the right of being impleaded within their own bounds, for which purpose separate sittings of the Courts of Queen's Bench, Common Pleas, and Exchequer, are held at Guildhall, besides local courts. The Court of Chancery has, however, evaded this franchise, and does not sit within bounds. The City courts have particular privileges and powers of sequestrating money and property within bounds by attachment. The City forms a separate jurisdiction in every respect, and has its own magistrates and police. The conservancy of the Pool, and of the Thames and Medway, and of the navigation and fisheries thereof, are within the jurisdiction. The possessions of the City include about 3000 houses within its bounds, in the manor of Finsbury, and elsewhere in London, and large estates throughout the country; a great domain in Ireland, and jurisdiction over the City of Londonderry, Town of Coleraine, and Borough of Southwark; allowances from the government for privileges surrendered; the metage or measuring of coal, corn, &c.; and rates levied for sewers and police. The city name their judges and other officers, and two sheriffs, who are likewise Sheriffs of Middlesex, which shrievalty is farmed from the crown. They have likewise the property or superintendence of several hospitals and schools. Under the statute of 2 William and Mary, session 1, c. 8, no Act of Parliament affects the city customs, unless the city be particularly named therein. To secure the maintenance of the city rights, the Remembrancer attends in the House of Commons during its sittings to watch the progress of measures. When the city send a petition to the House of Commons, it is presented at the bar by the sheriffs in their robes, instead of being presented through a member. Their own members of Parliament are four (the usual number for cities being two), and, on the first day of every new Parliament, claim the right of taking precedence of all other members, and sitting in their scarlet gowns and hoods. On a bill being presented from the city to the House of Commons, instead of leave being asked by a member, it is immediately read by the clerk at the table. The city has, too, the exclusive privilege of their addresses being received by the king seated on the throne. The Lord Mayor and Corporation then go up in state. A monument in Guildhall records a lecture given by the Lord Mayor Beckford to King George III. Whenever the city speaks it is by the mouth of the Recorder, and by him it gives evidence in courts of law of its customs, and not by any book or writing.

Many of the officers of the city are of considerable importance. The Sheriffs are for London and Middlesex, and are two chosen yearly by the Livery in Common Hall. The Lord Mayor may name a candidate, which is done by drinking to the health of the candidate. The election is held on Midsummer Day. A person refusing to serve must pay a fine of £600, unless he can swear he is not worth £15,000, and must bring six citizens as compurgators of his oath. A freeman, by birthright, must likewise bring six compurgators to prove his claim; but this ancient English law is now little more than a form. The office is honourable but expensive, and the cost is as much as £2000 for each sheriff beyond the fees. The Sheriff has a state carriage and chaplain, gives a banquet on his installation, contributes to the great dinner in Guildhall, and gives six dinners to the aldermen and other judges, at the Central Criminal Court. The Lord Mayor and Sheriffs are expected to attend the dinners of certain charitable institutions, and contribute to their funds. Each Sheriff chooses a solicitor as under-sheriff, who likewise takes part in the city ceremonials. All considerable officers wear a court dress on great occasions, unless they have some distinctive gown or other uniform. On the 28th of September, the Sheriffs are sworn on the hustings in the Guildhall, and, on the 30th, they go in procession with the Lord Mayor, city officers, and sixteen citizens of the company of each sheriff, to be sworn before the Cursitor Baron of the Exchequer, when the Recorder makes a speech in praise of each sheriff.

The Recorder of London is the chief local judge, and one of the chief functionaries of the corporation. He holds a court at the Central Criminal Court, as do two other officers, the Common Sergeant, and the Judge of the Sheriffs' Court. The salaries of all the city officers are liberal, and retiring pensions are given. The Recorder is as highly paid as a Scotch judge. He is the orator for the city on public occasions. The Common Sergeant, the Judge of the Sheriffs' Court, and the Secondaries of the Sheriffs, are other judicial functionaries. The Town Clerk, or secretary of the city, the City Solicitor, and the Remembrancer, are law officers. The latter is a kind of agent in Parliament, and at the Council and Treasury boards, and employed to preserve generally the rights of the city. Among these is an allowance of wine from the Treasury, and of summer and winter venison from the Woods and Forests, which are shared among the Lord Mayor, aldermen, sheriffs, and great city officers.

The Chamberlain is chosen by the Common Hall, and has usually held the office of alderman. Besides the care of the city income, he has charge of the apprentices, and admits to the freedom. On his coat of arms is borne the key of the City Treasury. The Comptroller of the Chamber has the charge of the city muniments and title-deeds, and is Vice-Chamberlain.

The Sword Bearer is marshal and regulator of the officers of the Lord Mayor's household, and has large emoluments. He wears a silk damask gown. The mode of bearing the sword is the subject of ceremonial; and, in 1849, the Lord Mayor, Duke, was called to account for allowing it to be borne before Prince Albert, at the opening of the Coal Exchange, in the same way as before the Queen. The sword borne is the pearl sword given by Queen Elizabeth.

The Common Crier is likewise a sergeant-at-arms to the Lord Mayor and the courts, and bears the cap of maintenance, and the great gold mace given by Charles I.

The Water Bailiff is also an officer of the household, but principally attends to the conservancy of the rivers. He wears a silver oar, and has a state shallop, manned with eight men on state occasions.

These are the chief officers of state of the city, but the Lord Mayor is likewise attended by the upper and under-marshals of the city. They wear a military costume, and attend the Lord Mayor in his public processions. In the Courts of Aldermen and Common Council they act as sergeants-at-arms.

Among the scientific officers of the corporation are the clerk of the city works, the surveyors, the librarian, and the officer of health.

In the patronage of the corporation are the markets of Smithfield, Newgate, Leadenhall, Farringdon, and Billingsgate; the Coal Exchange, (and, with the Mercers' Company,) the Royal Exchange, the meters of corn, coals, fruit, and salt; the locks on the Thames, the mooring, navigation, and hydraulic works of the Pool and rivers; the regulation of the colliers; London and Blackfriars' bridges; the prisons of Newgate, Whitecross Street, Giltspur Street, and the New Prison; the hospitals of Christ, Bethlehem, Bridewell, Emanuel, St. Bartholomew, and St. Thomas; Gresham College, the Freeman's Orphan School, and the City of London School. The watermen, carmen, and porters are under the control of the corporation. Most of the brokers are under the jurisdiction of the Court of Aldermen. The city is allowed to superintend the tax on coals, levied for the rebuilding of London Bridge.

The trade companies, or guilds, of the city are of interest on several grounds. They were originally voluntary fellowships, guilds, or associations for convivial, trade, or religious purposes; and, during the middle ages, a regular system of these guilds was formed with charters from the king or city, under which they possessed the power of regulating the trade interests of their members, and at one time they held the administration of the corporation as the Court of Common Council was chosen from the trade guilds, and not from the wards. At present, instead of governing the corporation, they are under its rule, and the corporation claim the right of constituting new guilds, and of regulating the old ones, in their by-laws, livery, and disputes. In the year 1848, the corporation exercised the privilege of increasing the livery of a company, thereby conferring the parliamentary franchise.

The guilds are formed on the same principle as the English guilds before the Norman invasion, but of their early history we have no records. At a later time these guilds either took the form, or were formed, as religious bodies, under the invocation of a saint. The style of the Drapers' is, "The Master and Wardens and Brethren and Sisters of the Guild or Brotherhood of the Blessed Mary the Virgin, of the Mystery of Drapers of the City of London." These bodies were benefit societies for helping old and sick members, for attending their burials (the Fishmongers yet have their pall), for causing masses to be said for their souls, for upholding the chapel of the patron saint, and for feasting. As the guild of a trade became considerable it received endowments of lands and goods, and bought charters confirming its jurisdiction over the masters, journeymen, and apprentices, over the quality of work, and the rate of wages. They grew so much in influence that, from the time of Edward III. to that of Richard II., they superseded the wardmotes and chose the Common Council, and other officers. The guild of Weavers became so powerful that the city was jealous of it, and obtained its banishment. Contests between leaders of the wards and those of the guilds for supremacy frequently disturbed the peace of the city; but the growth of the latter, and their possession of common purses and treasure, pointed them out for the exactions of the Tudor kings. When a forced loan or benevolence was levied on the city, it was found readiest to reassess it on the guilds. In the time of James I., the city and the guilds were called upon to take part in the plantations of Ulster, and thus were acquired the several Irish estates.

In the last century the internal jurisdiction of the guilds was virtually superseded by general Acts of Parliament; but the importance of the guilds was kept up by the parliamentary and common-hall franchise being restricted to the liverymen, instead of continuing with the body of the freemen.

In the present day, the guilds or city companies may be looked upon as fellowships of members of a trade, and of descendants of such, who enjoy the livery franchise, and the benefit of the endowments for purposes of festivity and charity. A company commonly consists of a Court of Assistants, self-elected for life, or by seniority; a Livery, named by the Court; and Freemen. The Court of Assistants yearly choose a Master (though some companies have none), and three or four Wardens (called prime or upper, middle, key, renter and younger, under or junior wardens). A fine of a large sum is paid (to the dinner fund) on coming upon the Court, and others in succession on serving the several wardenships and the mastership. In some, the fine for master is 100 guineas, which is supposed to pay for the installation dinner. The Court of Assistants are the governing body. They have several banquets yearly. The livery pay a fine on admission, commonly 20 guineas, sometimes as much as 100 or 200 guineas. They likewise have their funds for festivity. The freemen, unless strangers, seldom pay a heavy fine; nor have they dinner funds.

The company has commonly a hall, flags, maces and plate, and some funds for charitable purposes. The more considerable have hospitals, almshouses, schools, scholarships, livings, and pensions. The companies and their officials are styled "Worshipful." Histories have been written of the twelve great companies and others.

The freedom and livery of the companies are given for political services, as that of the city is, but more freely, or are sold to party men. The Fishmongers are now the great Whig club, and give Whig banquets; the Merchant Tailors the Tory club. The yearly dinners are occasions for political reunion and display, and it is therefore an object of interest to take part in them. Many of the ceremonies observed at the city dinners are peculiar. At great dinners the loving cup is passed round. A richly chased gold or silver standing cup and cover (the gift of some deceased benefactor), is placed before the Lord Mayor, or Master, and the master of the ceremonies proclaims, "The Master bids all welcome, and greets you all in the loving cup." The Clothworkers boast their Pepys, and other cups; the Painter Stainers that of Camden; the Barbers those of Henry VIII., Queen Elizabeth, and Charles II.

The cup or cups, filled with spiced wine, are passed round. As each receives the cup, his nearest neighbour rises, takes off the cover, and, standing, holds it until the drinker has done, when he passes on the cup, and is in like way helped by his neighbour. This old custom of pledging, one of the earliest observed by the English on their entry in this island, as the tale of Vortegern and Rowena exemplifies, is reverentially kept up by the citizens as implying the mutual service and brotherhood of all. The chased gold salver with rose water, follows the loving cup. The Master's installation is variously observed. In some companies (as the Carpenters'), the new Master and Wardens are crowned with silver coronals, garlands, or chaplets; in some (as the Clothworkers'), a procession enters after dinner of the late and new masters and wardens, each of the late officers bearing a standing cup; proclamation is made, that A B has been chosen the Master for the coming year, the old Master drinks the loving cup to him, and the new Master returns the pledge. Proclamation is made for each Warden, and a like form gone through. It is a current belief that the citizens consume in their rich feasts the incomes left for the poor; but on the contrary, funds are expressly provided and kept up for these banquets. The late Mr. Thwaites left to the Clothworkers' Company 30,000*l.*, half for charities and half for feasting. The livery dinner is a club, whereat a kindly feeling is kept up among men having the same common interests, and it is an institution zealously upheld. At these banquets, not only are all the luxuries which modern research has found out to be met with in profusion, but many of the dainties in which the mediæval epicure delighted; here are sometimes to be found the baron of beef, the boar's head, the swan, the crane, ruffs, and reeves, the warden pie, and other rarities in the modern bill of fare. Some dinners have distinctive names; a venison feast comes in season, and excursions are made to Blackwall, Greenwich, or Richmond, to taste suburban luxuries. It is not uncommon for parcels to be placed before each guest, of sweetmeats and cake, to take home to his wife and children, that they too may partake of the festivity. The dinners are usually confined to the men, but the greater companies do not fail to provide balls and excursions for the fair sex. Most of the wards and inquests likewise have dinners.

The apprentice and the freeman are admitted with ceremony in the full Court of the Assistants, robed in their gowns. The freeman by birthright is brought in by the beadle, and produces his baptismal certificate, and the copy of his father's freedom. Two or three old friends, freemen of the company, appear as compurgators, to give witness he is "son of his father." The oath of fidelity to the guild is administered to him, the Court standing, and he pledges himself faithfully to follow the trade in which he is enrolled, and neither to counterfeit nor defraud. Thereupon the Master and assistants each shake him by the hand, and hail him as a brother, and the renter warden points out to him the box for the relief of poor freemen.

After being admitted by the Court of his company, the beadle attends him to Guildhall, to receive the freedom of the city. The papers of the company are taken as authorities for the admission, and the clerk and officers of the Chamber put down their names as compurgators. The Chamberlain administers to him the oath of fidelity to the city, and shaking hands with him, delivers, under the city seal, the copy of his freedom. This is a small slip of parchment, the warrant of his franchises and that of his children. For some wards, this is stamped with the seal of the inquest, on the admission of a freeman into the ward.

The charity funds provide usually for the relief of decayed freemen, their widows, orphans, and in some cases of their aged daughters. The Stationers' and Clock-makers' provide for blind compositors and watch-makers, whose trades much affect the eyesight.

There are reckoned on the list eighty-nine companies, some of which are extinct, and some have no livery (as the Apothecaries and Parish Clerks), besides which there are the fellowships of the porters. The companies are arranged by precedency, not dependent on seniority, and twelve, as has been said, are styled great companies. The companies embrace nearly every trade in existence at the beginning of the last century, and many trades now obsolete, or nearly so, such latter are Girdlers (makers of griddles), Bowyers, Fletchers (arrow-makers), Longbowstring-makers, Lorimers, Hatband-makers, and Fan-makers.

The Mercers' is the first in rank, and has a hall. Its oldest charter is one of Richard II. The oath of the freeman contains several passages, which show the nature of these old pledges, and that there was the same patronage of secrecy as in modern associations of the trading classes. "You swear that you shall be true unto our sovereign lord the King. You shall be obedient to, and ready to come at lawful summonses and warnings of the wardens of the Mercery, when and as often as you be duly monished and warned by them. All lawful ordinances and rules by the Fellowship of the Mercery ordained, made, and stablished, and hereafter for the weal, worship, and profit of the said Fellowship to be made, you shall hold and keep. All lawful communications, necessary ordinances and counsels for the welfare of the said Fellowship, and the secrets thereof to you showed, you shall keep secret and hold for counsel, and them or any of them not discover or show, by any means or colour unto any person or persons of any other Fellowship. You shall also be contributary to all charges to you put by the Wardens and Fellowship, and to bear and pay your part of charge set for your degree, like as other of the same Fellowship shall do for their degree." The bearings of the Company, the bust of the Virgin Mary, are to be frequently seen on city buildings. The Company are half owners of the Royal Exchange and Gresham College; and owners of St. Paul's and Mercers' Schools; Whittington's College, at Highgate; Trinity Hospital, at Greenwich; and Stepney Hospital. They have the patronage of several lectureships in churches (among others, of the Golden Lectureship), and of exhibitions.

The Grocers' Company is the second, and is a great and hospitable company, The two Pitts were members of this company. The Hall was used in 1641 by the Committee of Parliament that met to settle the reform of the nation; and in the last century by the Bank of England.

The Drapers' Company is the third. There are several freewomen in this company, who are admitted to partake of its charities. It likewise grants liberal pensions to decayed members; to one who had served sheriff, 200*l.* The income in 1833, was 23,811*l.*, great part of which was from the large estates in Ireland; 4000*l.* or 5000*l.* is yearly spent in court, livery, and public feasts. Attached to the Hall is a pleasure garden, in the heart of the city, and which is free to the public.

The Fishmongers' Company is the fourth, and is the great Whig Company. It has 100 freewomen sharing in its charities. The income is about 20,000*l.* yearly (8000*l.* from Ireland). Of this, 10,000*l.* is spent in charities, and 3000*l.* in entertainments. St. Peter's Hospital, at Wandsworth, is liberally endowed.

The Goldsmiths', the fifth Company, is one of the few which still exercise trade functions. At their Hall are assayed and stamped all articles of gold and silver ware made within the London district, and the Government duty on plate is assessed. On plate are put several stamps; the Queen's bust, the Government mark; the leopard's head, the Company's mark; a mark to denote the quality; and a letter to denote the year of manufacture. It is by members of the Goldsmiths' Company, that is peformed the occasional ceremony of the assay in the Court of Exchequer of the pyx of Mint coins, in order to determine whether the national coinage is in conformity with the standard. This company gives splendid banquets and balls.

The Merchant Tailors', the seventh in rank, maintain a school of high reputation, and send many scholars to St. John's College, Oxford. Three dinners are yearly given to the livery; a grand political banquet on the 11th of June, on the occasion of the examination of the school by the President and Fellows of St. John's; a dinner to the Master and Wardens of the Skinners' Company, in pursuance of a decree made by the Lord Mayor and Aldermen, in 1824; a yearly dinner at Richmond, and seventeen court dinners. Many members of the Stock Exchange belong to this company. The Duke of Wellington is a Merchant Tailor.

The Vintners' Company have the valuable privilege that its members are exempted from the licensing acts, and the title of "Free Vintner," on a house or booth, enables its holder to sell wine without an excise or magistrate's licence.

The Clothworkers' Company give some good dinners in the course of the year, where much old plate, many ancient customs, and old cookery, may be seen.

The Dyers' Company, now the thirteenth, was anciently one of the twelve great companies. It has the rare privilege of keeping swans in the river Thames, on which as much as 300*l.* a year has been spent, besides a swan-hopping excursion to look after them.

The Coopers' is a wealthy Company, and keeps two good schools and an almshouse.

The Brewers' is a wealthy Company. Each of the companies collect a small contribution from its freemen, called quarterage; but in the Brewers' Company this is paid on the quantity of malt consumed by its members.

The Leathersellers' Company have an income of about 4000*l.* yearly, of which 400*l.* is spent yearly in feasting, and 1500*l.* in charities.

The Pewterers' Company have an assay master, for assaying pewter ware, and the members of the company are entitled to use a peculiar mark, or *touch*, which is registered on a pewter plate kept by the company in their hall. Their income is about 1300*l.* yearly.

The members of the Barbers' Company (formerly the Barber Surgeons), are still exempted from serving the office of constable, or upon the nightly watch, and from serving on all juries, inquests, attaints and recognizances. Their hall pictures and plate are ancient.

The Armourers and Braziers' Company have in their hall a collection of armour; the suits are sometimes used on Lord Mayor's Day, though, now, the armour is usually borrowed from the Tower Museum.

The Butchers' Company consists of about 1500 members of the trade, and the livery elect the Court of Assistants.

The Carpenters' Company invest their wardens with garlands, and give three dinners yearly to the livery, cakes to the members of the Court on Twelfth Day, and ribbon money to them on Lord Mayor's Day. Their income is above 2000*l.* yearly, of which 500*l.* is spent in feasting.

The Painter Stainers' Company assist diseased and paralysed painters in going to Bath for the waters.

The Cooks' Company are exempt from serving on juries in the City Courts.

The Fruiterers' Company present the Lord Mayor yearly with twelve bushels of early apples, and are entertained by him.

The Stationers' Company keeps a register of the copyrights of books, which dates from the time of Elizabeth, and is likewise of antiquarian interest, having been largely drawn upon for Shakspearian illustrations. The members of the livery are allowed to share in a trading stock, devoted to the publication of the Company's Almanacks. The income, exclusive of the trading stock, is about 2500*l.* yearly.

The Basket-makers' is one of the few unincorporated Companies, but of great antiquity, and recognized by the city. In 1825 a livery of thirty was granted to it by the Court of Aldermen. Their income is only 10*l.* a year.

The Paviers' is another unincorporated Company, and has no livery.

The Apothecaries' Company exists as a local institution and a general medical college. The licentiates of the latter are not members of the company. The membership, or freedom, is acquired by apprenticeship, the apprentice having to pass an examination in Latin, and the freeman the same examination as the licentiate. The quarterage is 10*s.* 6*d.* yearly, which goes towards the Botanical Garden. Members have privileges in forming the ruling body (the Court of Assistants), and the Court of Examiners, in holding stock, and in partaking of the funds of the company. The King's Apothecary claims the right of coming on the Court, independent of seniority. The company appoint examiners to grant licences to practise as apothecaries in England and Wales, and also to search their shops. In the Hall is a shop, extensive laboratories, a mill-house, and large pharmaceutical establishments. In 1623 a dispensary was set up at this hall, and in 1671 the chemical laboratory was set up. In Queen Anne's time, the company undertook the supply of drugs for the navy, and then the navy stock was formed. This is divided into two classes of shares, the first of 120 members, and the second of 220. The capital brings a good return. Sir Hans Sloane gave them the Botanic Garden at Chelsea, in 1722. These gardens cost the company a large sum, and they maintain professors of botany and chemistry, and give a botanical medal to the students, who are taught free of charge. Five botanical excursions take place yearly for the students, and are called the general herborizing, in the month of July, for the members only, when a dinner is given, at which several physicians and other professional men are invited as visitants. The livery have a dinner on Lord Mayor's day.

The Shipwrights' Company had their livery increased in 1830, from 100 to 200.

The Lorimers' Company and the Spectacle Makers', are two companies in which candidates for the city freedom and livery, not having connection with any particular trade, generally enrol themselves. To the latter, several civic dignitaries and members of Parliament belong.

The Needle-makers' is another Company deriving its income from the same persons. It was first chartered by the Lord Protector Cromwell, in 1656.

The Clock-makers' Company is strictly a trade company. They have a lending library, rich in English and foreign works on horology and the allied sciences, with a printed catalogue and a cabinet of specimens of watches, containing many rare objects. This latter, by the liberality of the Master, is sometimes lent for exhibitions at scientific conversaziones.

The office of Master of the Wheelwrights' Company is burdensome, for he has to pay a fine of 100*l.*, appropriated to dining the Court.

The Distillers' Company give to their freemen, on admission, a "book" containing various receipts for distilling strong liquors.

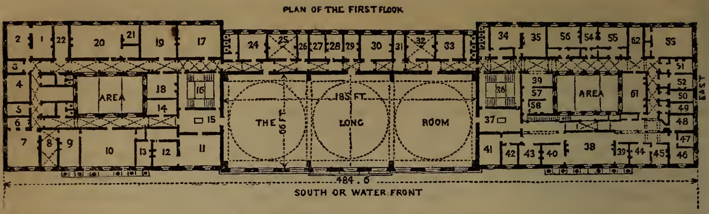
The Gunmakers' Company have a proof-house and proof-master, for proving and stamping gun and pistol barrels. Gun-making is one of the London trades. There is another proof-house at Birmingham, founded on the same plan, for the great gun-making district.

The Parish Clerks' Company do not confer the freedom of the city, nor the hereditary freedom.

CUSTOMS—CUSTOM HOUSE.

The Port of London is well known to carry on the largest business in the world. (See p. 114.) Its tonnage has no rival.

The Customs receipts are about twelve millions yearly, or half those of the two islands (the receipts from all Scotland and Ireland being little more than one-third of those of London), or about equal to those of Liverpool. The Custom House at London is likewise the central esta-



PLAN OF THE CUSTOM HOUSE.

blishment, but it is not so large as might be expected, arising from so much of the business being carried on in the docks, private warehouses, and elsewhere out of doors.

London is the great place of import for East and West India produce, that is to say, groceries and wines, besides carrying on a great trade with the corn, timber, and tallow countries, and in wool, drugs, and manufactured articles of luxury. The tonnage of ships entering from foreign parts is about 1,500,000 tons yearly; from the colonies, 500,000 tons; and from the English and Irish coasts, 3,000,000 tons; making an aggregate of 5,000,000 tons. The coal trade largely employs the coasters. Much of the foreign business of the port is in the intercourse of steamers with France, Flanders, Holland, and Dutchland. As London is the great entrepôt for England, for the supply of shipping, and for the neighbouring Continent, the warehousing business is large. The Custom House business has, therefore, a relation to these various circumstances.

From the time of the Normans, the Customs have formed a large part of the government revenues; and from the Revolution of 1688, direct taxation has been so little applied, that the prejudices of many of the population, and the interests of others, are strongly enlisted in favour of indirect taxation. The impositions of duties for protecting home interests likewise upheld this feeling. Within the last thirty years, however, this system has been greatly modified, and the Customs transactions of the port of London have been altered in conformity. Begun by Huskisson, and carried out by Peel, all duties on exports are abolished, as are those on raw materials, corn, and most articles of food, while as far as possible all duties of small returns are abrogated. Thus the duties are chiefly levied on groceries, wines, spirits, and tobacco. Upon all other articles, therefore, the functions of the Custom House are virtually statistical, and although returns are made of them, there are no charges. The export business gives some trouble to the Custom House, as articles are taken out of the bonded warehouses, and have to be examined; and wine, spirits, and tobacco, being subject to inland excise, are under peculiar regulations for shipment. (See pp. 121–123.)

Two great aids of the Custom House are the warehouses and the docks (see article "Docks"). The landing-places were anciently at Billingsgate and Queenhithe, where the examination of goods could be readily effected; but now the landing, instead of taking place at the King's Quays, is carried on along the whole shores of the Thames, below bridge, and from time to time the government has authorized wharfs to be places for the landing of goods, under the name of "Sufferance Wharfs." Warehouses are likewise licensed for the storing of goods until payment of duty, under the government and merchants' keys, and as a bond is given for the due security of the goods, these are called "Bonded Warehouses." At these wharfs and warehouses departments of the Customs are established. These establishments, the wealthy proprietors of which are known as wharfingers, are, however, surpassed by the docks and warehouses belonging to the great corporations, each of which carries on the trade of a sea-port, and requires a large customs' staff. The bonded warehouses are likewise seats of manufacture, for many articles are allowed to be prepared and manufactured in bond, for use at home, or for shipment abroad. The merchant can thus, without the payment of duty, receive goods from abroad, and prepare them for the use of some other foreign market.

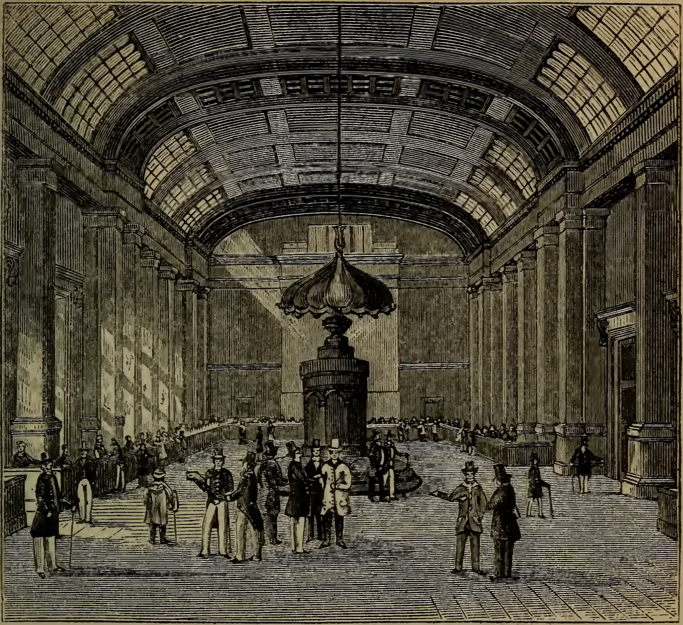
The Custom House, in Lower Thames Street, is the chief seat of business, and the establishment is presided over by a board of commissioners, with a chairman and deputy-chairman. None of the commissioners or officials is allowed to sit in Parliament, or even to vote for a member, as the patronage has always been looked upon with jealousy. It is under the control of the Treasury, who undertake the parliamentary responsibility.

The board have a secretary and staff, surveyor for buildings, and staff, and solicitor and staff.

The chief departments are those of the surveyor-general, the receiver-general, the examiner, and comptroller of accounts, the inspector-general of imports and exports, which is the statistical office, the registrar-general of shipping, the long room, the landing department, the check, the Queen's warehouse, the coast guard, the water guard, and the alien registration.

In the Long Room of the Port of London, in the Custom House (see plan above), notices are given of the arrival and departure of shipping, the entry and clearing of goods (see interior view, p. 339.) The landing department, the check office, and the water guard, take charge of a ship on arrival, put officers on board, examine the goods on landing, and assess the duties. The superior staff consists of landing surveyors and landing waiters, under whom are 30 gaugers, 120 lockers, and 180 weighers. On the water guard are tide surveyors, having a staff of 500 tide waiters, 60 watchmen, and 80 watermen.

The registrar-general of shipping gives certificates of registry to English shipping, which are the title-deeds of the ship. Lloyd's register is for shipping of all nations, and has reference to the character of the ship. It is the business of the Alien Office to register all foreigners entering by sea, but the regulations of importance in time of war are now much relaxed.



INTERIOR OF CUSTOM HOUSE.

The Customs establishment is regularly organized, with scales of promotion for the severa ranks of officers, and having superannuation and other benefit funds.

Although the Customs regulations are greatly improved, they are much open to objection, the Treasury and the board, from jealousy of their officers, causing serious impediments to business. The landing surveyors and waiters have arduous duties imposed upon them in the assessment of charges, according to quality or value, and even *ad valorem* duties are found to be productive of evils. The Custom House has the power of taking goods which it considers undervalued, at the merchant's valuation, with 10 per cent. added, and these are sold at the periodical Custom House sales, when, if a profit is realized beyond the duty, the officer shares in it. It therefore happens, sometimes, if the importer has made a good bargain, it is taken from him by the Customs, and the profit beyond 10 per cent. becomes theirs.

DOCKS.

The Docks of London show at once to the observer the great enterprise and prosperity of the port of London. It will readily be conceived that a population of 2,000,000 of persons must necessarily, to a great extent, be supported by its trade and commerce—its proceeds in money value far exceeding in amount that of any other community in the world. The merchant is the dealer with the trading universe, the tidal Thames bringing with its flow the treasure of near and distant nations; and, with the aid of steam, persons of all nations come to us with objects of business and mutual interchange. The plan in p. 341 shows the singular figure of the Thames, and the relative situation of each dock; see also pp. 344, 348, and 349, for diagrams of Her Majesty's Dockyards of Deptford and Woolwich.

The following are the names of the Docks of which there are public companies, to which are added those of the Government Yards.

East and West India Docks, instituted 1799.
East India, instituted 1803; united 1838.
Dock Master, Captain Evans.
London Docks, 1802.
Secretary, J. D. Powles, Esq.
Commercial Docks, 1807.
Superintendent, William Jones, Esq.
Grand Surrey Canal Dock.
Superintendent, William Mc. Cannon, Esq.
St. Katherine Docks, 1828.
Secretary, Sir John Hall.
East Country Dock.
Secretary and Superintend., A. Sherriff, Esq.
Regent's Canal Company, 1812.
Secretary, E. L. Snee, Esq.

H. M. Dock Yard and Arsenal, Woolwich.
Superintendent, Commodore H. Eden.
Master Shipwright, Oliver Lang, Esq.
Deputy do., James Peake, Esq.
H. M. Dock Yard, Deptford.
Superintendent,
Master Shipwright,

In addition to the above, there are a great many private docks for the building and repairing of ships, for the construction of iron vessels, and for the fitting of engines to vessels of all tonnage, and the making and embarking of steam engines.

By King Richard the First's first charter granted to the citizens of London, the corporation became conservators of the River Thames, extending westward from London Bridge to the River Colne, near Staines; and, eastward, over the port and waters of the Thames, ports and creeks, and also over the River Medway, as far as Yantlet Creek, in Kent, and Leigh, in Essex. The Corporation of London have the right of regulating shipping, and of all other things concerning the navigation, and of licensing and permitting wharfs, docks, &c. Subsequently the extent and limits of the Port of London, as far as relates to Her Majesty's Customs, are declared by the Court of Exchequer to extend to the North Foreland, in the Isle of Thanet, then northward in an imaginary line drawn to the opposite point, called the Haze, on the coast of Essex, through the Gunfleet Beacon, excepting the privileges of the Ports of Sandwich and Ipswich, and the several creeks, harbours, havens, &c., belonging to them. (See woodcut, p. 354.)

The property in the rivers and rivulets that fall into the Thames, their fish, and the soil beneath, within certain boundaries, are vested in the Corporation of London. The divisions of the Port of London, as defined by the by-laws and customs of the harbour service, are the Upper Pool, the Lower Pool, Limehouse Reach, Greenwich Reach, Blackwall Reach, and Bugsby's Reach. Several dredging machines are constantly in operation for effectually cleansing the river. Since the institution of the Corporation of the Trinity House, in the year 1515, 400,000,000 tons of ballast have been raised in the River Thames.

In an account taken in the year 1831, the Receipts were	£30,239	17*s.*	9*d.*
Cost of procuring the same	23,741	15	11
Net profit for one year	6498	1	10

St. Katherine's Docks being the nearest to London Bridge, we shall briefly describe these the most recently-constructed docks. The old Hospital of St. Katherine, and 1250 poorly-tenanted houses which stood on the site, were happily removed, together with the vicious and badly-housed inmates, who numbered nearly 12,000 persons. The company for the construction of these docks was formed in 1824, and the docks were opened on the 25th October, 1828. The capital first raised was £1,352,800, and an additional sum of £800,000 was also raised. The space included within the outer wall is about 24 acres, about eleven of which are wet docks; they consist of two docks, communicating with each other by basin, and are surrounded by large and lofty stacks of warehouses, and wide and commodious quays. The lock leading from the river is 180 ft. in length, and 45 ft. in width, between the entrance gates, and is so constructed that vessels of upwards of 600 tons burden may pass and repass three hours before high-water, so that outward-bound ships from these docks can reach Blackwall before the tide begins to recede. The depth of water at the top of the spring tides, on the sills, Trinity datum, is 28 ft.; at the dead neap tides, 24 ft.; at low water spring tides, 10 ft.; and at low water neap tides, 12 ft.; so that vessels of upwards of 800 tons register are docked and undocked without difficulty, and the depth of the water at the entrance exceeds that of any other wet dock in the Port of London, as may be seen by the table in p. 342:—

References to the Engraving opposite.

1. London Bridge.
2. Custom House.
3. The Trinity House.
4. The Tower.
5. The Mint.
6. St. Katherine's Docks.
7. London Docks.
8. St. Saviour's Dock.
9. Wapping.
10. Thames Tunnel.
11. Tunnel shaft.
12. Rotherhithe Church.
13. Shadwell Church.
14. Commercial Railway.
15. Regent's Canal.
16. Basin.
17. Bromley Canal.
18. Grand Surrey Docks.
19. Commercial Docks.
20. Ordnance Wharf.
21. Greenland Dock.
22. Victualling office.
23. Royal Dock-yard.
24. Deptford Creek.
25. Drunken Dock.
26. Ferry house.
27. Royal Hospital.
28. Royal Naval Asylum.
29. Norfolk College.
30. Mr. Beale's iron works.
31. Messrs. Enderby's rope works.
32. Folly House Tavern.
33. West India House.
34. South-west India Dock.
35. Timber dock.
36. West India Dock reservoirs.
37. East India Docks.
38. Bow Creek.
39. All Saints' Church.
40. Chapel.
41. Limehouse Church.

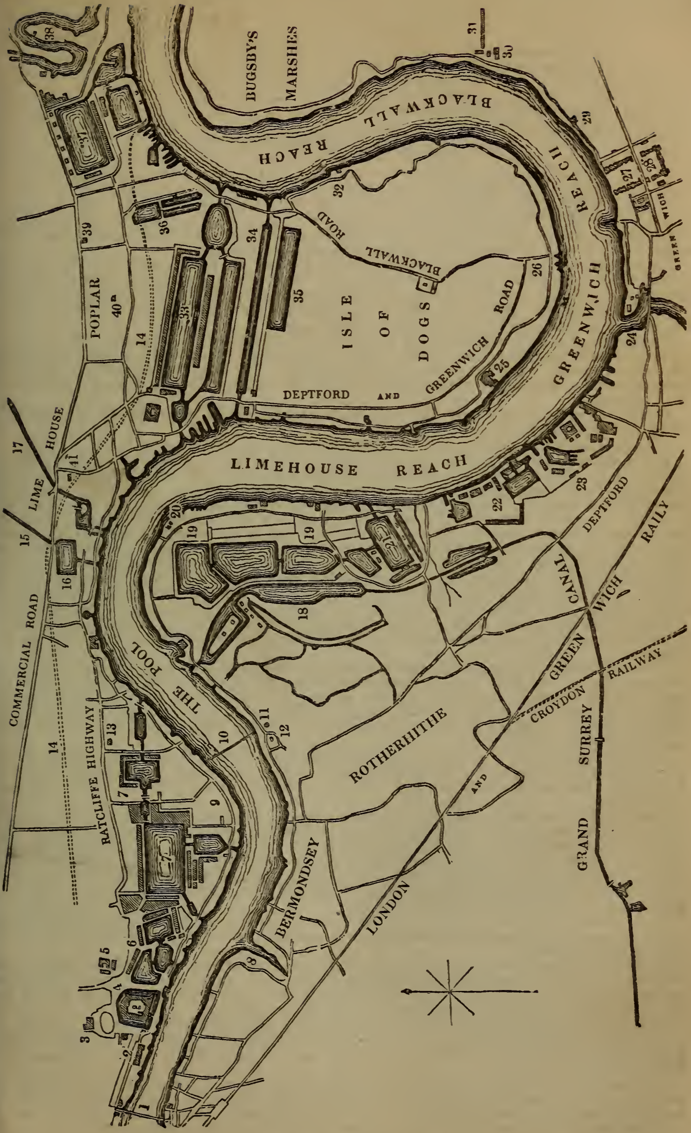

BUGSBY'S MARSHES
BLACKWALL REACH
BLACKWALL ROAD
ISLE OF DOGS
DEPTFORD AND GREENWICH ROAD
GREENWICH REACH
LIMEHOUSE REACH
LIME HOUSE
POPLAR
COMMERCIAL ROAD
RATCLIFFE HIGHWAY
THE POOL
ROTHERHITHE
BERMONDSEY
LONDON AND CROYDON RAILWAY
GREENWICH RAILWAY
GRAND SURREY CANAL
DEPTFORD
GREEN WICH
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FIGURE OF THE THAMES.

Depth of Water on the outer Sill of Gates at low water, Spring Tides, Trinity datum.

	Feet.	Inches.
St. Katherine Docks	10	0
London Docks, Hermitage entrance	3	0
,, ,, Wapping ditto	5	0
,, ,, Shadwell ditto	6	6
Regent's Canal, entrance of Basin	1	0
West India Dock, Limehouse entrance	4	3
,, ,, South ditto, formerly the City Canal	6	0
,, ,, Blackwall entrance	6	0
East India Docks, entrance	6	6
East Country ditto ditto	5	6
Commercial ditto ditto	0	9
Grand Surrey Canal ditto	1	6

Vessels are also docked and undocked by night as well as by day; an advantage first introduced in the Port of London by the St. Katherine Docks Company.

These docks have also a wharf between the Tower and the dock entrance, of 187 ft. river frontage, for the accommodation of steam-vessels, where passengers land and embark free of expense, at any time of the tide, and without the intervention of boats. Convenient waiting-rooms for passengers and their luggage are constructed, and excellent arrangements made for the landing and shipping of carriages, horses, cattle, &c.

The warehouses, vaults, and covered ways, will contain 110,000 tons of goods. The diameter of the columns to support the superincumbent weight above are sufficiently ample to support the greatest weight. The works were designed and executed from the designs and under the superintendence of the late Thomas Telford, and the warehouses under that of Philip Hardwick, Architect.

In 1846, the gross receipts were £229,814 14*s*. 10*d*.; gross debits, £124,269 14*s*. 7*d*.; leaving a balance of profit amounting to £105,545 0*s*. 3*d*.

The next undertaking of this nature, going down the river, are

The London Docks, which are nearly adjoining to those of St. Katherine, and are situated in Wapping. They extend from East Smithfield to Shadwell, and were originally intended principally for the reception of ships laden with wine, brandy, tobacco, and rice. These docks consist of two capacious docks; the western dock covers an area of above 20 acres, being 1260 ft. long, and 960 ft. wide, and the eastern dock an area of 7 acres. The tobacco dock and warehouses are between them, the dock exceeding 1 acre in extent, and used solely by tobacco ships. The entrances to these docks are—the Hermitage, or upper entrance, which leads to the western dock through the Hermitage basin; the Wapping, or central entrance, which communicates with the same dock through the Wapping basin, covering an area of more than 3 acres; and the Shadwell, or lower entrance, which communicates with the eastern dock, through the eastern basin. This lower entrance, which is of recent construction, is one mile below the Hermitage entrance, and three-quarters of a mile below the Wapping entrance. The entire quantity of ground comprised within the outer boundary wall of the docks is 71 acres and 3 roods.

The warehouses are capacious in size, convenient in arrangement, and magnificent in design and execution. The great tobacco warehouse, on the north side of the tobacco dock, is the largest, finest, and most convenient building of its sort in the world. It is rented by Government at £14,000 per annum. It will contain 24,000 hogsheads of tobacco, and covers the immense space of nearly 5 acres. There is also a very large tobacco warehouse on the north side of the tobacco dock.

Under the warehouses is a series of the most magnificent vaults in the world, which include an area of more than 18 acres, and have convenient and ample stowage for 66,000 pipes of wine and spirits: they are the great depôt for the stock of wines belonging to the wine merchants of London.

These docks, constructed by the late John Rennie, Engineer, were opened on the 30th January, 1805, and the first vessel admitted was a fine brig called "*The London Packet*," from Oporto, laden with wine. All ships bound for the Thames, which were laden with wine, brandy, tobacco, and rice (except ships from the East and West Indies, which use their own docks), were obliged to unload in these docks for the space of 21 years from the date of their opening; but this monopoly having expired January 30th, 1826, the use of these docks is optional, as is the case with the others.

The entrance from the Thames at Shadwell was constructed in 1831, by H. R. Palmer, Engineer, and the lock-gates of these docks are ingenious and scientific examples of the skill of both these engineers.

In 1844–45, the new tea warehouses, capacious enough to receive 120,000 chests of tea, were erected. This great establishment comprises in the whole an area of 90 acres; with three entrances from the Thames, viz., Hermitage, 40 ft. in width; Wapping, 40 ft. in width; and Shadwell, 45 ft. The whole structure cost £4,000,000 of money.

The next important work of skill and science in our Port, proceeding down the river, is

The Grand Surrey Canal, the spacious and convenient docks of which are situated at Rotherhithe, adjoining to and on the upper side of those belonging to the Commercial Dock Company.

The entrance from the Thames is between King and Queen Stairs and King's Mills, nearly opposite the lower entrance to the London Docks. The situation, plans, and extent of this and all the docks, are fully described in "The Public Works of Great Britain," large folio.

Proceeding downwards in this survey, toward Blackwall, the next scientific work is

The Regent's Canal and Basin, which was projected by John Nash, Architect, and reaches from the Thames at Limehouse to the Grand Junction Canal at Paddington. The basin is commodious and well suited to its trade, and the canal, having two tunnels, proceeds up the country 8½ miles, with a fall of 90 ft., by 12 locks, exclusive of the tide-lock at the Thames, through Limehouse, Stepney, Hackney, Islington, the Regent's Park, and onwards to Paddington. It was commenced October, 1812; opened from Paddington to the Regent's Park Basin in 1814; and throughout to the Thames, in August, 1820. Mr. James Morgan was the Engineer. It is used largely for coals from the up country.

The next scientific work, going downwards, is

The Bromley or Poplar Canal, which was made about seventy years since, from the Thames at Limehouse, where it has a capacious and secure lock for barges, through Poplar into the River Lea, at Bromley, to avoid the long and circuitous route from Bow round the Isle of Dogs to Limehouse (see woodcut, p. 341). This passage is as dangerous for barges, and such other craft as navigate the Lea, as it is circuitous, and liable to constant impediments from contrary winds and tides. The entrance is between that of the Regent's Canal and Limekiln Dock, and is about 1¼ mile in length.

Our next step is to that magnificent establishment

The West India Docks, which were the first wet-docks ever constructed in the Port of London. Constructed by William Jessop, Engineer. It is singular that, notwithstanding the obvious utility of wet-docks, and the vast trade of the metropolis, there was no establishment of this sort on the Thames till nearly a century after a wet-dock had been constructed at Liverpool. This may have arisen from the lesser need of such establishments in the Port of London (from its superiority to that of Liverpool as a natural harbour), till the increased trade compelled its adoption.

These docks are not only the earliest, but are still the most extensive of the great warehousing establishments in the Port of London, covering 295 acres. They were begun in February, 1800, and the first stone laid by William Pitt, in July, and were partially opened in August, 1802. They are situated, as may be seen in the woodcut, p. 341, across the isthmus which connects the peninsula called the Isle of Dogs with the Middlesex side of the Thames. They consisted originally of two docks, one for imports and the other for exports, the former holding 204 vessels each of 300 tons; each communicating, by locks, with a basin of nearly 6 acres in extent, at the lower end next Blackwall, and with another basin of more than 2 acres, at the upper end next Limehouse: they both communicate with the Thames, by means of capacious locks and extensive pier heads.

In addition to their already extensive premises, the West India Dock Company purchased from the Corporation of London, in 1829, the City Canal, with its adjacent grounds and buildings, three-quarters of a mile long, cutting off the great bend of the river. It runs parallel to the two other docks, is now called the South Dock, and is appropriated to the wood and timber trades, for the greater accommodation of which the Company have since excavated a pond of 19 acres in extent, for the reception of bonded timber.

The Export Dock, or that appropriated for ships loading outwards, will hold 195 vessels; is about 2600 ft. in length, by about 400 ft. in breadth, and covers an area of nearly 25 acres. The North, or Import Dock, is the same length by 500 ft. in breadth, and has a superficial area of nearly 30 acres. The north side of the Import Dock is bounded by 11 large stacks of extensive warehouses for sugars, coffee, and other dry goods; the south side by an extensive quay and warehouses for rum; and an eastern and western wood quay and sheds. The Import Dock has large sheds for the reception of goods sent down for shipment, and numerous offices for the Excise, Customs, &c., and other necessary out-buildings. The whole are surrounded by lofty boundary walls; and the side next Poplar, from the Blackwall Basin to that at Limehouse, by a broad and deep moat or ditch. Northward of the Blackwall Basin are a large elevated reservoir and two settling reservoirs below.

The South Dock is nearly 3700 ft. in length, with excellent lock entrances at both ends, being nearly ¾ of a mile in length from pier head to pier head. Both the locks of this dock, as well as that which opens into the BlackwallBasin, are 45 ft. in width, which is wide enough to admit vessels of 1200 tons burthen. At spring tides the depth of water in the docks is 24 ft., and the whole will contain 600 vessels, from 250 to 500 tons burden.

The Company have now the East India Dock, and are called the East and West India Dock Company.

The wood-sheds, in which enormous quantities of mahogany, ebony, rosewood, &c., are deposited, do credit to the ingenious machinery of railways attached to the girders, for the use of the locomotive cranes for transporting and depositing the enormous blocks of timber, often of 4 and 5 tons weight, in their respective places, by the aid of only 4 or 5 men, which were invented and executed by the late John Rennie, who completed these docks after the death of Mr. Jessop, their prior and original engineer. He says the sum saved in wages by this new process in the first half year, was sufficient to defray the whole expense of the machinery.

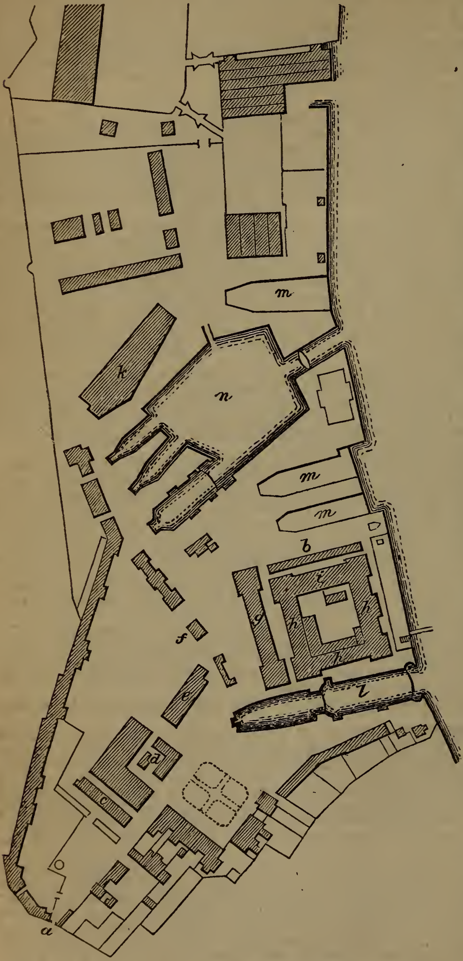
Proceeding still downwards from the Limehouse entrance of the West India Docks, is the extensive establishment called

The Commercial Docks; the docks, yards, and warehouses of which and also their relative situation in the Port, which is nearly opposite the upper entrance to the West India Docks, are shown with great accuracy, and to a large scale, in "the Public Works of Great Britain." They consist of 6 docks, of which No. 1, formerly the Greenland Dock, covers a surface of 9¾ acres. The entrance to these docks is through that numbered 1, and is nearly opposite the King's Arms Public-house, Mill Wall. No. 2 adjoins the former to the westward, and covers a space of 1¾ acres. No. 3 is northward of No. 1, with which it is connected by a cut, and contains 3¾ acres. No. 4 is northward of No. 3, and is similarly connected therewith, and contains 10 acres. No. 5 adjoins No. 4 to the north-east, and contains 15 acres; and No. 6 adjoins the former to the northward, and contains 18½ acres. It contains several spacious bonding yards, timber sheds, warehouses, granaries, drying-kilns, &c.

From the situation of these very extensive docks, which include within their boundaries nearly 70 acres, of which about fifty-eight are water, they might easily be made, now the trade of the Port of London has so wonderfully increased, and is still increasing, to rank among the most prosperous establishments of the metropolitan harbour.

Pursuing our course down the river, and passing the lower or eastern entrance of the West India Docks, the next large commercial establishment is that called

The East India Docks, which are situated at Blackwall, 3½ miles from the Royal Exchange. The first stone was laid in March, 1805, and the Docks opened in August, 1806. They were originally intended for the accommodation of ships belonging to or employed by the East India Company, or in that country trade; but they are now, in consequence of the dissolution of that Company as a commercial corporation, open to vessels from all parts and in all trades, now united with the East and West India Dock Company. They consist of an import dock, 1410 ft. in length, and 560 ft. in breadth, covering an area of nearly 19 acres; and an export dock, 760 ft. in length, and 463 ft. in breadth, covering a surface of nearly 9 acres; besides a spacious entrance basin, which connects the dock with the river, of nearly 3 acres. The various works of these excellent docks were executed from the designs and under the superintendence of the late Ralph Walker and John Rennie. The length of the entrance lock is 210 ft., and the width of the gates 48 ft. in the clear. The depth of water in the docks is never less than 23 ft., so that they can accommodate ships of larger burden than any other docks in the river. There is attached to these a splendid quay fronting the river, called the Brunswick Wharf (now also used for the termini of the Blackwall Railway), nearly 700 feet in length, with water sufficient at all times of the tide to float the largest steam ships; and the export dock is furnished with a powerful and lofty machine, which is able to mast and dismast the largest ships. This new steam-boat wharf was designed and executed with cast-iron plates and sheeting, by James Walker, late President of the Institute of Civil Engineers, in the first volume of whose Transactions it is most elaborately detailed. On this wharf is the Brunswick Tavern, built for the accommodation of company arriving or departing by the larger class of steam ships, and for white bait and dinner parties.



a	Yard gate.
b	Spinning house.
c	Shop.
d	Smiths' shop.
e	Sawpits.
f	Pitch house.
g	Rigging and sail house.
h	Store houses.
i	Ropery.
k	Plank shed.
l	Docks.
m	Building slips.
n	Basin.

PLAN OF DEPTFORD DOCK.

Deptford, a large old town on the south bank of the Thames, in the county of Kent, about 3 miles from London Bridge, has two parishes and an ancient dockyard, used as a Royal dockyard, established by Henry VIII., who also first erected here a storehouse. It has since become a victualling establishment, and, recently, a capacious naval storehouse, with batteries of biscuits for the Royal Navy, the very ingenious machinery for which, and for other purposes, has been constructed by the Messrs. Rennie. The finest machinery in the world is employed in Deptford Dock-yard, for spinning hemp and manufacturing ropes and cables for the service of the navy. The whole detail of this machinery is to be found in Vol. 8 of the Papers of the Royal Engineers. A striking proof of the relative superiority of rope manufactured upon Capt. Huddart's principle over that made by the old system, in point of strength and durability, was formerly afforded in the instance of the London and North Western Railway, employing it to propel the engines from Euston station to Camden-town, by an endless rope running upon pulleys, urged by the power of the fixed steam-engine.

DIMENSIONS OF THE DIFFERENT VESSELS BUILT AND LAUNCHED AT DEPTFORD, SINCE THE REOPENING OF THE DOCK-YARD IN 1844.

Ships' Names.	Date when launched.	Guns.	Length between Perpendiculars.		Length of Keel for Tonnage.		Breadth, extreme.		Breadth for Tonnage.		Breadth Moulded.		Depth in Hold.		Burthen in Tons, Old Measurement.
			ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	Nos.
Worcester..	Oct. 10, 1843, before the yard was re-established.	60 Frigate.	172	0	144	9	43	8	....		....		14	6	1468
Porcupine..	June 17, 1844.	St. Vl.	141	0	124	$7\frac{1}{8}$	24	2	24	0	23	6	13	6	$382\frac{40}{94}$
Terrible ..	Feb. 26, 1845.	St. Vl. 21.	226	0	196	$10\frac{1}{4}$	42	6	42	0	41	2	27	4	$1847\frac{7}{94}$
Spitfire	March 26, 1846.	St. Vl.	147	4	130	$2\frac{1}{2}$	25	1	24	11	24	5	14	6	$429\frac{91}{94}$
Hound	May 21, 1846.	10	95	0	74	6	30	4	30	1	29	7	13	6	$358\frac{57}{94}$
Sidon	May 26, 1846.	St. Vl.	211	0	185	3	37	0	36	$6\frac{1}{2}$	35	10	27	0	$1315\frac{63}{94}$
Odin	July 24, 1846.	St. Vl.	208	0	187	$1\frac{1}{2}$	37	0	36	6	35	10	24	2	$1326\frac{4}{94}$
Termagant.	Sept. 25, 1847.	Screw	208	3	181	0	40	6	40	0	39	4	25	9	$1540\frac{40}{94}$
Reynard ..	March 21, 1848.	Screw	147	8	128	$4\frac{7}{8}$	27	$9\frac{3}{4}$	27	$5\frac{3}{4}$	26	$11\frac{3}{4}$	14	6	$515\frac{61}{94}$
Phaeton ..	Nov. 25, 1848.	50	186	10	152	$8\frac{1}{2}$	49	$5\frac{3}{4}$	48	$10\frac{3}{4}$	48	$1\frac{3}{4}$	15	$10\frac{1}{2}$	$1941\frac{53}{94}$
Archer	March 27, 1849.	Screw	180	0	162	$7\frac{3}{4}$	33	$10\frac{1}{2}$	33	$6\frac{1}{2}$	32	$10\frac{1}{2}$	18	11	$973\frac{22}{94}$
Wasp	May 28, 1850.	Screw	180	0	162	$7\frac{3}{4}$	33	$10\frac{1}{2}$	33	$6\frac{1}{2}$	32	$10\frac{1}{2}$	18	11	$973\frac{22}{94}$
Leopard....	Nov. 5, 1850.	St. Vl.	218	0	194	0	37	6	37	0	36	4	25	2	$1412\frac{65}{94}$
Hannibal ..	Now Building.	90	208	0	170	$7\frac{3}{8}$	58	0	57	2	56	4	24	0	$2965\frac{75}{94}$
Emerald ..	Now Building.	60	185	0	152	$2\frac{1}{8}$	52	0	51	6	50	8	15	8	$2146\frac{81}{94}$
Imperieuse	Now Building.	Screw	212	0	180	$8\frac{3}{8}$	58	0	49	6	48	8	16	9	$2355\frac{45}{94}$

In 1515 a Society was founded at Deptford, by Sir Thomas Spert, knight, incorporated by Henry VIII. The grant was made to institute, to the "honour of the Blessed Trinity and St. Clement, a guild or brotherhood, concerning the cunning and craft of mariners, and for the increase and augmentation of the ships thereof," and all proceedings and matters concerning sea-marks, and to erect lighthouses upon the several coasts of the kingdom, for the security of navigation, &c., now called the Trinity Board, and located in Tower-hill. Captain Richard Maples, who died commanding a ship in the East Indies, in 1680, left to the Trinity-house 1300*l.*, with which a part of the almshouses was built. The Emperor Peter the Great of Russia worked as a shipwright in the dock-yard, and upon his return to Russia and founding the city of Petersburgh, adopted the English 12-inch rule, which to this day is the ordinary measure for practice in the building operations of the artisans of that country. In this dock-yard many large ships-of-war have been constructed. The *Hannibal*, 90 guns, is now in the course of construction, and the *Leopard*, steam ship-of-war; also ships have been fitted for scientific discoveries, particularly those of Capt. Cook, the great navigator of the globe. In the illustration in page 344 is shown the present plan of this dock-yard, and a list, in page 345, of the ships built here is an interesting fact. Master shipwright, Charles Willcox, Esq.

WOOLWICH, in the county of Kent, about 8 miles east of London-bridge, is one of the most interesting and important situations (within the port of London) for the maritime and military operations of Great Britain, possessing a most commodious dock-yard (see accompanying plan across pages 348-9) and arsenal, barracks for troops, depôts of all the appointments for war purposes and the defence of the country, and a Royal military academy. It was anciently a small fishing village; but its peculiar situation on the banks of the Thames, and its proximity to the capital, and therefore facility of control by Government, render it a natural, national, and political position.

THE ROYAL ARSENAL.—On the right and left of a spacious gateway are two lodges; the one on the right is occupied by one of the gate-keepers of this extensive establishment; and that on the left is an office for the bombardier of the royal artillery on duty, to enter the names, designations, and places of residence of the parties applying for admission to visit the arsenal, in a book kept for that purpose.

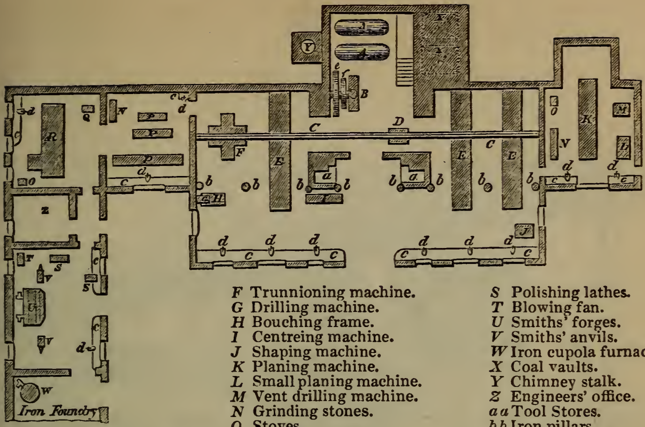
Orders were issued in 1840, immediately after the destructive fire at Devonport dock-yard, not to admit any person into the buildings in the royal arsenal, except on business, and only to allow the public to walk over the grounds; but as there is every reason to believe this restriction will soon be removed, the following information may prove interesting.

The first place visited by strangers is the foundry for casting brass guns and howitzers. The original foundry possessed by government was established in Upper Moorfields, London, near Finsbury-square; and its removal from thence to Woolwich was in consequence of the following accident: the Duke of Richmond, Master General of the Ordnance at that period, having ordered a large re-cast of the guns taken by Marlborough from the French, several of his friends, and a large concourse of spectators, attended to witness the operation. A foreigner of the name of Schalch, who happened to be present, felt convinced, by observing moisture in the moulds, that an explosion was to be apprehended, and warned the Duke and the surrounding spectators of their danger. No sooner had the burning metal been poured into the mould than it exploded with great violence, by the force of the steam which it generated, and severely injured several of the bystanders. M. Schalch, having given proof of his knowledge in this department, was offered a commission to select a spot within 12 miles of London for the erection of a new foundry, and also to be made superintendent of the whole concern. The proposal being highly advantageous, he readily accepted it, and fixed on the Warren at Woolwich as the most eligible situation.

The foundry was originally erected by Sir John Vanbrugh, and finished in 1719.

The machinery and tools employed in the manufacture of cannon, in the Royal Arsenal, have been recently constructed and erected by Mr. Napier, of London.

Previous to that time the manufacture was carried on in the most primitive manner. The boring mills or lathes which came from Holland about eighty years ago were in separate



A Steam boilers.
B Steam engine.
C Overhead railway.
D Locomotive crane.
E Gun boring Lathes.
F Trunnioning machine.
G Drilling machine.
H Bouching frame.
I Centreing machine.
J Shaping machine.
K Planing machine.
L Small planing machine.
M Vent drilling machine.
N Grinding stones.
O Stoves.
P Self-acting lathes.
Q Cutter forming machine.
R Large lathe and wheel cutting engine.
S Polishing lathes.
T Blowing fan.
U Smiths' forges.
V Smiths' anvils.
W Iron cupola furnace.
X Coal vaults.
Y Chimney stalk.
Z Engineers' office.
a a Tool Stores.
b b Iron pillars.
c c Work benches.
d d Vices.
e Fly wheel.
f Drum of steam engine.

PLAN OF WOOLWICH CANNON FOUNDRY.

buildings, to each of which was attached a 4-horse mill; upon the end of the shaft which brought the motion from the mill was a square box or chuck; into this box fitted a square, cast upon the gun behind the cascable. The muzzle of the gun ran in a circular collar plate, which was firmly kept in its place by means of iron bolts, connected to a strong foundation of iron-work and masonry. In the process of boring, the bit was forced into the gun by means of an endless screw, with rack and pinion, which was moved by a man or boy, while the laborious operation of turning was effected entirely by the hand tool: when bored and turned, the gun was put on a carriage, and taken to another building to be vented.

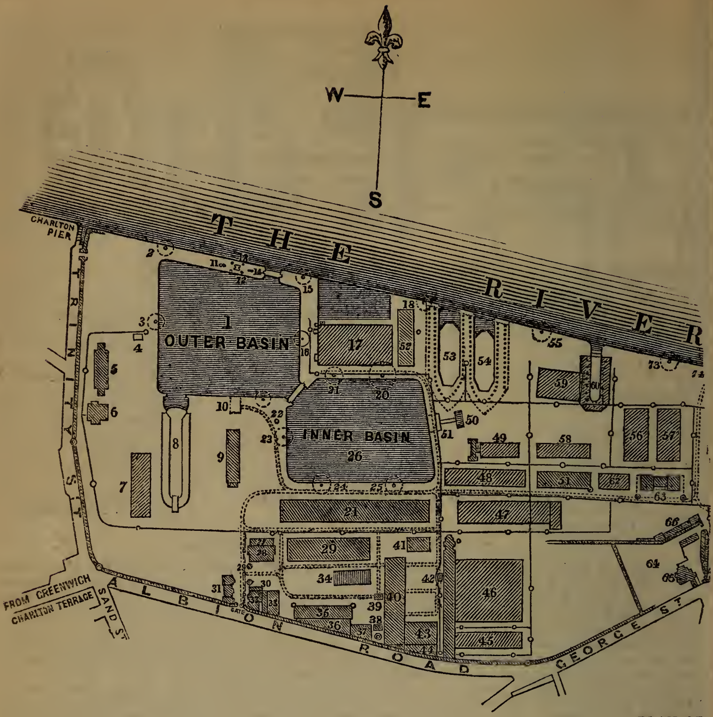
Here it was placed on blocks of wood while the several holes were drilled, which was performed by two men with a crank brace drill, the pressure being communicated from heavy iron weights placed above. The copper vent was drilled in a lathe, one end of the bolt on a centre, the other in a collar plate: the motion was given by two men on a fly-wheel, while the drill was held in the hand of another workman. In the same lathe the vent was turned and the screw cut upon it, both operations being performed by hand. When the copper vent was screwed into the gun, the projecting part inside was wrenched off by the workmen with a half-round bit: the gun was again put on a carriage, and taken to another building to be trunnioned.

When here, it was placed on blocks of wood, with the trunnions in a vertical position; one of the trunnions was then set off, and about ¼ inch of it brought to the proper size by the chisel and file. Upon this was placed a circular box, with a cutter fixed on the under side of it; on the other or upper side was fixed a vertical spindle, which received pressure from heavy iron weights hung above it. Long levers were now attached, and two or three men kept walking round and round until this part of the trunnion was completed; the extreme end of the trunnion being finished by chisel and file. The other trunnion was then turned up, and the same operation performed upon it; after which the gun was again placed on a carriage, and taken to another building to be finished.

Such was the tedious, rude, and imperfect system in use until about four years ago, when the necessity of a change was rendered manifest to the then Master-General of the Ordnance, the late Lord Vivian, who directed the Inspector of Artillery (Lieut.-Colonel Dundas) to submit for his consideration such plans as he should, under the circumstances, deem necessary; the machinery was then ordered, with very material and important additions authorised by Sir George Murray and the present Board of Ordnance, and other necessary machines constructed in the establishment.

The prime mover is an expansive and condensing steam engine of 12-horse power, which may be worked at a pressure of 30 lbs. to the square inch, if required: it has two cylindrical boilers, only one of which is used at a time. The power is transmitted from this steam engine by a large strap passing over the drum, and over a corresponding drum on the main shafts, which distributes the power over the factory with a locomotive or travelling crane. The crane travels on a railway of cast iron, which extends the length of the building above the centre of the lathes. In the factory adjoining is an iron foundry and blacksmiths' shop, the fan for blowing the cupola and the forges being driven by the steam engine. The machinery is elaborately described in the 8th vol. of the Papers of the Royal Engineers.

Close by is the laboratory. Here fire-works and cartridges for the use of the army and navy are made; as well as bombs, carcases, granados, con-

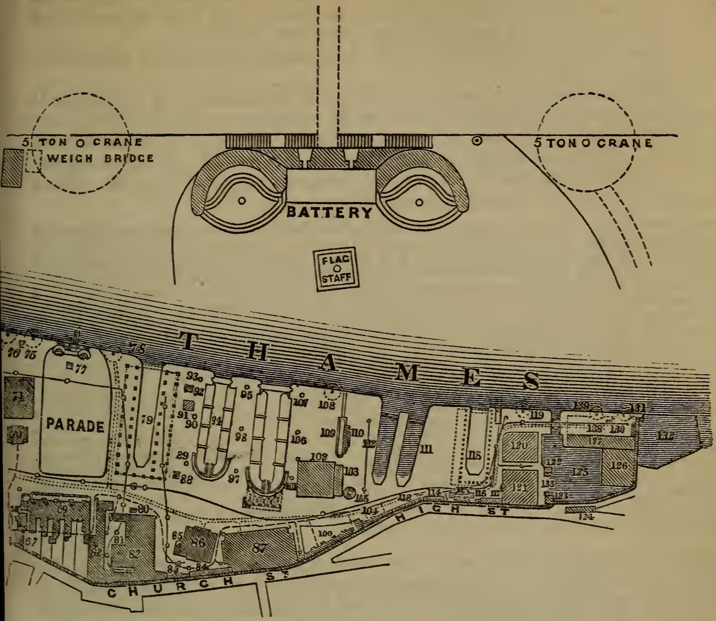


PLAN OF

1. Outer basin.
2. 9-ton crane.
3. 10-ton crane.
4. Dynamometer.
5. West Smithery.
6. Engine house; tank over.
7. Shed.
8. Dock No. 1.
9. Engineers' work-shed.
10. Shears.
11. Capstan.
12. Ditto shears.
13. Ditto ditto.
14. Ditto.
15. 4-ton crane.
16. Crane.
17. Mast house.
18. Crane.
20. 10-ton crane.
21. 20-ton crane.
21*. Fitting and erecting shop.
22. Capstan.
23. 20-ton crane.
24. Ditto.
25. 20-ton crane.
26. Inner basin.
27. Brass-founders' shop.
28. Copper-smiths' shop.
29. Smithery.
30. Fire engine.
31. School for apprentices.
32. Police quarters.
33. Iron store.
34. Boiler-plate furnaces.
35. Punching shop; pattern-makers' shop over.
36. Boiler-plate store.
37. Coal and coke store.
38. Coke oven.
39. Weigh bridge.
40. Boiler factory.
41. Engine house.
42. Weigh bridge.
43. Foundry.
44. Drying stores, &c.
45. Timber shed.
46. Ditto.
47. Ditto.
48. Drying shed.
49. Sawpits.
50. Crabs to shears.
51. Shears.
52. Steam machinery store house.
53. Slip No. 1.
54. Do. No. 2.
55. Crane.
56. Timber sheds.
57. Ditto ditto.
58. Sawpits; joiners' shop over.
59. Converters' pound.
60. Slip No. 3.
61. (erroneously marked 51), Mould loft.
62. Engine-makers' shops, &c.
63. Surgery, guard house, and offices.
64. Garden.
65. Superintendent's house.
66. Officers' stables.
67. Police station.
68. Inspector of police station, &c.

greve and other rockets; adjoining the river, an immense field of ordnance, intended for batteries and ships, may be seen, and are always ready for immediate supply. Many very interesting objects for the visitor, too many to be described in our space, may be viewed with advantage in this arsenal.

The Woolwich Dock-yard is the oldest in the kingdom, having been esta-


5 TON O CRANE
WEIGH BRIDGE
BATTERY
FLAG STAFF
5 TON O CRANE
THAMES
PARADE
HIGH ST
CHURCH ST
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67

WOOLWICH DOCKYARD.

69. Officers' houses.
70. Offices.
71. Chain, &c., proving house.
73. 7-ton crane.
74. 5-ton crane.
75. Ditto.
76. Ditto and weigh bridge.
77. Battery.
78. 5-ton crane.
79. Slip No. 4.
80. Weigh bridge.
81. Yard.
82. Store house.
83. Armoury.
84. Treenail loft.
85. Boilers.
86. Steam hammer shop.
87. Smithery.
88. Privies.
89. Capstan.
90. Ditto.
91. Pitch house.
92. Privies.
93. Capstan.
94. Dock No. 2.
95. Capstan.
96. Dock No. 3.
97. Capstan.
98. Ditto.
100. Officer's house.
101. Capstan.
102. Steam saw-mills; joiners' shop over it.
103. Engine house; tank over it.
104. Stores.
105. Chimney.
106. Capstan.
107. Ditto.
108. 5-ton crane.
109. Sir William Burnett's apparatus.
110. Ditto.
111. Slip No. 6.
112. Slip No. 5.
113. Storing house; (erroneously marked No. 118.)
114. Storing house.
115. Steam kiln.
116. Gas meter.
117. Offices.
118. Slip No. 7.
119. Crane.
120. Boat house.
121. Store boat house.
122. Sawpit.
123. Storing house.
124. Old guard house.
125. Boat pond.
126. Cable store.
127. Rigging house.
128. Wharf.
129. Crane.
130. Weigh bridge.
131. Crane.
132. The groove or plane for floating timber.
133. Grindstone.

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blished as early as 1512. On the left hand of the entrance is a handsome building, the residence of Commodore Henry Eden, Royal Navy, who is superintendent of the whole establishment.

Visitors, on entering the gate, pass under a neat colonnade into the dockyard police-office, where their names, designations, and addresses are inserted in a book kept for that purpose. The members of the dock-yard police are very civil, and obligingly give such information as they may be acquainted with, connected with the various objects worthy of notice.

The first residence on the right hand is occupied by the master shipwright, storekeeper, &c., &c.

The blacksmiths' shop is an object well worth the attention of visitors, as it contains several massive hammers, moved by steam power, for forging anchors of the largest size, and massive bolts, used for the largest ships in the British navy. There are also several furnaces, and a great number of forges, all the latter supplied with wind from powerful fanners, instead of bellows. About two hundred men are employed in this department.

Very near is what is usually called the testing house; in this very important department all iron cables, anchors, &c., are sufficiently tested for service. The press was constructed many years since, and has been most efficacious. The strain is produced by hydrostatic pressure; its amount is estimated by a system of levers balanced on knife edges, which act quite independently of the strain upon the machine, and exhibit sensibly a change of pressure of ⅛th of a ton even when the total strain amounts to 100 tons. This proving machine was constructed by Messrs. Bramah, of Pimlico. Our plan (pages 348-9) shows the several very important objects in this yard, those for the building of ships of all classes, basins and docks for the repair of steam ships, and every appointment for the fitting and refitting this all-important arm of our service. Captain Denison states, in vol. viii. of the Papers of the Royal Engineers, that the docks in Her Majesty's yard at Woolwich had been a subject of serious consideration for some years; they were constructed of wood, and although the timbers and planking of the bottom were sound, yet the side timbers composing the altars, and the land ties, and other framing, &c., were in a state of decay. A plan for straightening the river front of the yard, and, at the same time, adding a valuable space to its interior, had been in operation since 1835, in which plan the construction of two new docks on the site of the old wooden docks was a prominent feature. After the several improvements were made in the frontage, a new dock was constructed, a section across which shows the coffer dam, wall, and counterforts, the whole of such excellent work as to give it a permanent character, and to admit steamers of the largest class. The volumes entitled "The Papers of the Corps of Royal Engineers," contain notices of some engineering and mechanical contrivances in this yard.

Royal Military Repository.—The near approach to the grounds of the Repository is attractive, being that of a constructed fort, with guns placed in the embrasures. The gunners of the Royal Artillery practise the art of defending fortifications, slinging guns on gyns, throwing pontoons, or floating bridges, across a small lake to an island in the centre, and various other duties connected with this service.

Visitors, on entering the gate, turn to the right, and the sentinel will point out a range of buildings on the left, into the second door of which there is an entrance, and the bombardier on duty for the day will insert their names in a book devoted to that purpose. The rotunda being the most prominent object, strangers generally proceed to it without waiting to examine the numerous pieces of ancient and modern ordnance arranged on the ground. The building has a singular and picturesque appearance, being erected on the extremity of the high ground, with a precipitous descent at the north side, beautifully wooded and interspersed with water; and in the distance is an excellent view. The rotunda was first erected by the command of George IV., from a design by Mr. Nash, architect, for the purpose of receiving and banqueting the allied sovereigns of Europe, during their visit to this country, at the conclusion of the peace of 1814. After serving the original purpose for which it was erected, it was presented to the garrison at Woolwich, and converted into a depository for models of a naval and military description; and the objects in every department of both services collected here are highly creditable to those who have the care and management of the arrangements of this valuable institution. The building is 24-sided, and 120 ft. in diameter, presenting a grand vista and uninterrupted view from whatever part of the interior visitors may be stationed.

The models in this department are truly remarkable, and should be examined with care.

The Royal Military Academy.—The military academy was first erected in the royal arsenal as early as 1719, and was chartered by warrant of George II.

in 1741. The building in the arsenal being at length found too small for the increasing wants of the institution, a spacious pile was erected in the beginning of the present century on the south-eastern extremity of Woolwich Common, and to this site the entire academy was removed in the year 1806. Here are contained barracks for the accommodation of 160 cadets, together with class-rooms for their studies, offices of the Lieutenant-Governor and Inspector, lecture-room, dining-hall, gymnasium and racket-court, &c. The dining-hall has within these few years been decorated with painted windows, and ornamented with armour, banners, &c., under the superintendence of Capt. F. Eardly Wilmot, R.A., the second captain of the cadet company.

The progressive demand for increased scientific instruction, together with the late increase in the numbers of the ordnance corps, having again required still further space, a portion of the original building in the arsenal has been again fitted up for the accommodation of 40 cadets. These form the practical class, while the 160 cadets at the upper academy are divided into four classes of 40 each, called the theoretical classes.

The cadets form the first company of the royal regiment of artillery, and the discipline of the company is carried on by the military branch of the institution, consisting of

Governor and Captain	Field-Marshal the Right Hon. the Marquis of Anglesey, K.G., G.C.B., G.C.H., &c.	appointed	July,	1846.
Lieutenant-Governor	Maj.-Gen. J. Boteler Parker, C.B.	„	April,	1846.
Second Captain	Capt. F. Eardly Wilmot	„	Jan.,	1847.
Ditto	Capt. Talbot	„	Aug.,	1848.
Lieutenant	H. T. Fitzhugh	„	June,	1850.
Ditto	J. E. Thring	„	Oct.,	1850.
Quartermaster	William Elliot	„	Feb.,	1847.
Chaplain	The Rev. A. C. Fraser	„	Jan.,	1847.

The civil branch of the institution, under whose superintendence the studies are carried on, consists of

Inspector	Col. W. D. Jones, R.A.	appointed	March,	1840.
Assistant Inspector	Capt. J. Morris Savage, R.A.	„	Aug.,	1840.

For the Theoretical Classes.

Professor of Mathematics.	Samuel Hunter Christie, M.A., F.R.S.	„	July,	1806.
Professor of Fortification.	Capt. Williams, R.E.	„	Dec.,	1844.
First Mathematical Master.	At present vacant.			
Second ditto	James R. Christie, F.R.S.	„	May,	1837.
Third ditto	William Rutherford, L.L.D., F.R.A.S.	„	April,	1838.
Fourth ditto	John Fry Heather, M.A.	„	Feb.,	1840.
Fifth ditto	Stephen Fenwick, F.R.A.S.	„	June,	1841.
Sixth ditto	The Rev. G. Y. Boddy, M.A.	„	June,	1841.
Seventh ditto	William Racster, M.A.	„	March,	1847.
Instructor in Fortification.	Capt. Bainbrigge, R.E.	„	May,	1845.
Ditto	Capt. Boxer, R.A.	„	Feb.,	1847.
Instructor in Descriptive Geometry.	Thomas Bradley	„	June,	1841.
Instructor in Geometrical Drawing.	G. S. Pritchard	„	Sept.,	1844.
Second Ditto	W. Grain	„		1850.

Landscape Drawing Master.	James Bridges	appointed	Jan.,	1838.
Second Ditto . . .	George B. Campion . . .	,,	Dec.,	1841.
Instructor in Plan Drawing.	Capt. John Gore, R.A. . . .	,,	April,	1848.
German Master . .	H. A. Troppaneger	,,	March,	1836.
Second Ditto . . .	C. A. Feiling	,,	Feb.,	1841.
French Master . .	Albert Tasche	,,	Sept.,	1829.
Second Ditto . . .	Alphonse Lovey . . . - .	,,	Feb.,	1840.
Instructor in History and Geography.	The Rev. G. Y. Boddy, M.A.	,,	June,	1841.
Lecturer on Chemistry	Michael Faraday, LL.D.,F.R.S.			

For the Practical Class.

Instructor in Surveying.	Capt. Stothard, R.E. . . .	appointed	July,	1843.
Assistant ditto . .	Lieut. H. Y. D. Scott, R.E. .	,,	Jan.,	1848.
Instructor in Practical Artillery.	Capt. W. M. Dixon, R.A. .	,,	April,	1846.
Assistant ditto . .	Capt. John Travers, R.A.. .	,,	July,	1847.
Lecturer on Practical Astronomy.	The Rev. M. O'Brien, M.A. .	,,	Jan.,	1849.
Lecturer on Mechanics	John Anderson	,,	Sept.,	1848.
Lecturer on Geology and Mineralogy.	James Tennant	,,	Sept.,	1848.

The officers of the royal engineers and royal artillery are supplied entirely from the royal military academy. The cadets are admitted between the ages of 14 and 16 upon their passing an examination in the first elements of mathematics, French, German, and Latin, and being approved by the surgeon. At the end of one year from the date of appointment, they are again examined, and if not found to have made such progress as to make it likely that they will ultimately qualify themselves for a commission, they are removed from the institution. If, however, they pass this ordeal, they must pass a satisfactory examination in the entire theoretical course before removal to the practical class, and failing to do so within four years from the date of entrance, they are removed from the institution. The course of instruction in the practical occupies one year, and a final examination then takes place before a board of officers, after which those who have thus completed their course of study are invested with commissions in the royal engineers, or royal artillery, according to the proficiency which they have exhibited in all the branches of study.

Royal Marine Barracks.—These barracks are erected in an elegant situation, and command a most extensive view of the whole town of Woolwich, the windings of the river Thames, and the surrounding country. They are capable of accommodating about 500 men. Their duty here is principally to mount guard on the convicts at the dockyard, and the excellent band belonging to this corps march with the men at a quarter past ten o'clock every morning, when the guard is relieved. Attached to this division is an hospital for their sick, and the sick of Her Majesty's vessels visiting or stationed at Woolwich.

Woolwich contains a population of about 25,000, exclusive of the military, the number of whom stationed in the various barracks amounts to upwards of 3000. Visitors would be gratified with a walk on the Plumstead-road, on the left of which is the practice ground in the marshes, where the men of the royal artillery practise with balls and shells at a target. The rich old abbey lands of Erith, with their mouldering walls, and beautiful views of the river, add to the pleasure of those who extend their walk in that direction.

On the south of the town of Woolwich the walks are beautiful; the romantic seclusion of Nightingale Vale, and the magnificent view which opens to strangers as they ascend towards the summit of Shooter's-hill cannot be excelled for beauty and pleasing associations in any part of the kingdom.

A List of Ships that have been built in Woolwich Dock-yard for the last twenty years, with interesting particulars of them.

Rate.	Name of the Ship.	Guns.	Length of the Lower Deck.		Length of the Keel for Tonnage.		Breadth, extreme.		Breadth for Tonnage.		Breadth Moulded.		Depth in Hold.		Burthen in Tons.	When Built.
			ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.	ft.	in.		
3	Hawke	74	176	1	144	10½	47	8½	....		47	0½	21	1½	1753	1820
Brig	Beagle	10	90	0	73	7⅝	24	6	....		24	0	11	0	235	1820
,,	Ba raconta	10	90	0	73	7⅝	24	6	....		24	0	11	0	235	1820
6	Niemen	28	113	8	94	8½	31	7	....		31	1	9	1	502	1820
6	Athol	28	113	10	94	10	31	7	....		31	1	8	9	503	1820
Cuttr.	Highflier	..	55	7	44	6	18	6	....		18	1	7	6½	81	1821
,,	Hart	..	55	6	44	5	18	6	....		18	1	7	6½	81	1821
4	Winchester	50	173	1	145	7	43	10	....		43	2	14	6	1487	1822
6	Kingfisher	10	90	0½	73	8	24	7	....		24	1	11	0	237	1823
6	Magnet	10	90	0½	73	8	24	7	....		24	1	11	0	237	1823
6	Pylades	20	110	1	90	2⅞	30	0¼	....		29	5	8	2	433	1824
Ycht.	Royal Charlotte	..	85	8	72	8⅜	22	10½	....		22	4½	8	2	202	1824
6	North Star	28	113	9	94	9¾	31	6¼	....		31	0¼	8	9	501	1824
Stm.	African	..	109	11½	91	11¾	24	6¾	....		24	0¾	13	4	295	1825
6	Tyrian	10	90	0	72	3	24	1	....		....		11	0	232	1826
6	Tyne	28	125	0	106	7⅛	32	6½	....		31	10½	9	9	600	1826
5	Hebe	46	151	9¼	127	1	39	11¼	....		39	3¼	12	9	1078	1826
Stm.	Confiance	..	111	8	92	3⅜	24	6	....		24	0	13	6	294	1827
Stm.	Echo	..	111	9	92	4⅜	24	6	....		24	9	13	6	294	1827
5	Clyde	..	152	0	127	3⅞	40	3½	....		39	3½	12	8¼	1081	1828
Stm.	Columbia	..	129	9	111	3½	24	9¼	....		24	0¼	13	7	355	1829
6	Curlew	10	90	1	72	4⅜	24	9¼	24	7¼	24	1¼	11	0	233	1830
6	Nautilus	10	90	1½	72	4¾	24	9½	24	7½	24	1½	11	0	233	1830
Stm.	Pluto	..	135	0½	118	8¼	24	2½	....		23	6½	11	10	365	1831
2	Thunderer	84	196	1½	161	11½	52	2¼	51	5¼	50	8¼	22	6	2279	1831
Stm.	Dee	..	166	7	146	9¼	30	4¼	30	0¼	29	6¼	16	4	703	1832
4	Vernon	50	176	0	144	6¼	52	8½	52	0½	51	4½	17	1	2082	1832
Stm.	Firefly	..	155	0	136	8	27	6½	27	8½	26	10⅛	16	7	7549	1832
Pkt.	Pandora	..	90	0	71	0¾	29	2½	29	0½	28	6½	13	10	318	1833
Stm.	Medea	..	179	4½	157	4⅞	31	11	31	7	30	11	20	0	835	1833
Stm.	Spitfire	..	155	0	136	8	27	9⅛	27	7⅛	26	11⅛	16	10½	553	1834
Pkt.	Star	..	95	0	74	11¼	30	3	30	0	29	6	14	8	358	1835
Corv.	Modeste	18	120	0	98	10⅓	33	2½	32	10½	32	4½	14	2	568	1837
Pkt.	Crane	..	95	0	74	9½	30	3½	30	0½	29	6½	14	10	359	1839
Stm.	Lizard	..	120	0	105	0⅛	22	8¼	22	6¼	22	0¼	13	0	283	1840
6	Cygnet	14	95	0	74	6	30	4	30	1	29	7	13	6	358	1840
Stm.	Locust	..	120	0	105	0⅛	22	8½	22	6½	22	8½	13	0	283	1840
6	Siren	14	110	0	86	5⅝	34	10	34	6	34	0	14	10	549	1841
1	Trafalgar	120	205	6	170	5	55	7½	54	9½	53	11½	23	2	2721	1841
Stm.	Devastation	..	180	0	156	4¾	36	0	35	8	35	0	21	0	1058	1841
6	Heroine	14	95	0	74	8⅞	30	3½	30	0½	29	6½	13	7	358	1841
Stm.	Infernal	..	180	0	156	5¾	36	0¼	35	8¼	35	0¼	21	1	1059	1843
4	Worcester	52	173	1	145	3⅝	44	3	43	8	43	0	14	6½	1473	1843
4	Chichester	..	173	1	145	2⅝	44	9	44	1	43	5	14	6	1501	1843
3	Boscowen	..	180	0	146	9⅜	54	0	53	3	52	6	22	4	2213	1844
Stm.	Sampson	..	203	6	178	5⅝	37	6	37	0	36	4	23	0	1299	1844
Stm.	Gladiator	..	190	0	164	8⅝	37	8	37	2	36	6	23	0	1210	1844
5	Amphion	36	177	0	152	5⅜	43	2	42	8	42	0	13	4½	1473	1846
Stm.	Sphynx	..	180	0	156	5½	36	0½	35	8½	35	0½	20	11	1061	1846
Stm.	Niger	..	194	4	170	11⅞	34	8	34	4	33	8	21	6	1072	1846
Stm.	Basilisc	..	190	0	166	9¾	34	5	34	1	33	5	21	5	936	1848
4	Nankin	50	185	0	153	0⅞	50	10	50	2	49	6	15	10½	2049	1850

Master Shipwright, Oliver Lang, Esq.
Assistants ditto, James Peake, Esq., and Henry Chatfield, Esq.

The following cut is interesting, as showing the great extent of the legal privileges of the port of London, before referred to.

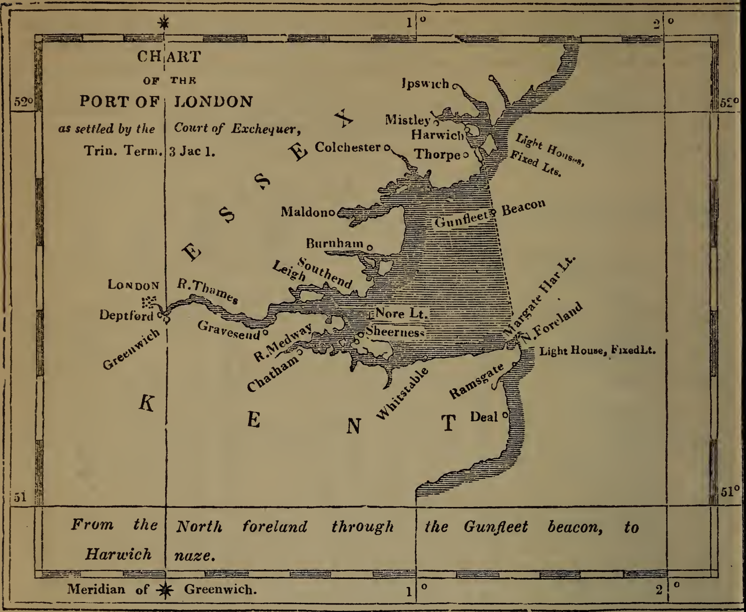
CHART OF THE PORT OF LONDON
as settled by the Court of Exchequer, Trin. Term. 3 Jac 1.
52°
51
1°
2°
52°
51°
ESSEX
Ipswich
Mistley
Harwich
Colchester
Thorpe
Light Houses, Fixed Lts.
Maldon
Gunfleet Beacon
Burnham
Leigh
Southend
LONDON
Deptford
R. Thames
Greenwich
Gravesend
R. Medway
Chatham
Nore Lt.
Sheerness
Margate Flat Lt.
N. Foreland
Light House, Fixed Lt.
Whitstable
Ramsgate
Deal
KENT
From the North foreland through the Gunfleet beacon, to the Harwich naze.
Meridian of Greenwich.

DUCAL RESIDENCES IN LONDON.

It may be interesting to strangers to have a brief description or references of those houses and palaces belonging to distinguished noblemen and senators, residents in London, who are members of the Upper House of Parliament, of whom follows a short account:—

George Douglas Campbell, Lord Sundridge and Hamilton, Hereditary Master of the Queen's Household in Scotland, Keeper of Dunoon, Dunstaffnage, and Carrick, DUKE OF ARGYLE in Scotland. Residence, No. 2, Hamilton Place, Piccadilly. Seats in the country, Inverary Castle, Argyllshire; Roseneath and Ardincaple, Dumbartonshire; Long-Niddry, Haddingtonshire; Halnaker, Sussex.

Henry Somerset, DUKE OF BEAUFORT, Marquess of Worcester, High Steward of Bristol, Residence, 22, Arlington Street, St. James's Street; back-front in the Green Park, splendidly decorated at a considerable cost. Seats in the country, Badmonton House, and Stoke-Gifford, Gloucestershire; Troy House, Monmouthshire.

Francis Russell, DUKE OF BEDFORD, Marquess of Tavistock, K.G. Residence, No. 6. Belgrave Square. Seats in the country, Woburn Abbey, and Oakley, Bedfordshire; Tavistock House, Devonshire. The Dukes of Bedford are notorious for being good landlords.

Walter Francis Montagu Douglas Scott, Earl of Doncaster, Lord Tynedale, Lord Lieutenant of Edinburghshire and Roxburghshire, a Governor of the Charter House, Colonel of the Edinburgh Militia: DUKE OF BUCCLEUCH AND QUEENSBERRY in Scotland. Residence, Montague House, Privy Gardens, Whitehall. Seats in the country, Dalkeith Palace, and Caroline Park, near Edinburgh; Drumlanrig Castle, and Langholm Lodge, Dumfriess-shire; Bowhill, Selkirkshire; Branxholme, Roxburghshire; Boughton, Northamptonshire; Richmond, Surrey; Ditton Park, Buckinghamshire; Beaulieu, Hampshire. The Duke's London residence is retiring from the main street. The back-front has a commanding and fine view of the Thames. It was inherited from the noble family of Montagu. The Duke unites with his large fortune, a goodness of heart, munificence in his encouragement of the Arts, of Trade and Commerce, and of Education. For an account of the pictures, see "Galleries of Art."

His Royal Highness the DUKE OF CAMBRIDGE, Earl of Tipperary, and Baron Culloden, Lieutenant-General in the Army. Residence, No. 94, Piccadilly, and Kew Palace. The house in Piccadilly is a noble mansion, with stone front opposite to the Green Park.

Henry Vane, DUKE OF CLEVELAND, Earl of Darlington, a Colonel in the Army; Colonel of Durham Militia, K.G. Residence, No. 17, St. James's Square. Here is the fine full-length portrait of the Duchess of Cleveland by Lilly, of which the head has been engraved so beautifully by Fairthorne, the celebrated engraver, of the time of Charles II. Country seats, Raby Castle and Bridges Cottons, Durham; Newton House, Yorkshire; Snettisham Hall, Norfolk.

William Spencer Cavendish, DUKE OF DEVONSHIRE, Marquess of Hartington, Lord Lieut. and Custos Rotulorum of Derbyshire, and High Steward of Derby, K.G., K.A., D.C.L. No. 78, Piccadilly; recessed back, a neat, plain, well-proportioned brick building, built by William Kent for William Cavendish, third Duke of Devonshire. It stands on the site of Berkeley House, destroyed by fire, October 16th, 1733, costing 20,000*l.*; the Duke presenting an addition of 1000*l.* to the architect. For the Gallery of Pictures, see "Galleries."

Henry Fitzroy, DUKE OF GRAFTON, Earl of Euston, Hereditary Ranger of Whittlebury Forest, Northamptonshire. Residence, No. 47, Charges Street, Piccadilly. Country seats, Euston Hall, Suffolk; Wakefield Lodge, Northamptonshire.

Alexander Hamilton Douglas, DUKE OF BRANDON, Lord Dutton, Hereditary Keeper of Holyrood House, Lord Lieutenant of Lanarkshire, F.R.S. and S.A.; DUKE OF HAMILTON, and Premier Peer in Scotland, Duke of Chatelherault, in France. Residence, No. 12, Portman Square. In this Mansion there are some of the finest pictures of the late Mr. Beckford, brought from Bath. Country seats, Hamilton House, Lanarkshire. (The late Mr. David Hamilton, architect of Glasgow, did much to improve this Palace, chiefly in the Greek style); Kinnoul House, Linlithgowshire; Brodrik Castle, Buteshire; Ashton Hall, Lancashire; and Easton Park, Suffolk.

Augustus Frederick Fitzgerald, Viscount Leinster, Lord Lieutenant and Custos Rotulorum of Kildare, a Visitor of the Royal College of St. Patrick, Maynooth, DUKE OF LEINSTER and Premier Peer in Ireland. Residence, No. 6, Carlton Terrace. Seat in Ireland, Curton, Kildare.

George Montagu, DUKE OF MANCHESTER, Viscount Mandeville, a commander in the navy. Residence, No. 9, Grosvenor Street. Seat in the country, Kimbolton Castle, Huntingdonshire.

James Graham, Earl of Graham, Lord Belford, Lord Lieutenant of Stirlingshire, Chancellor of the University of Glasgow, Colonel of the Stirling, Dumbarton, Clackmannan and Kinross Militia, K.T., DUKE OF MONTROSE in Scotland. Residence, No. 45, Belgrave Square. Seat, Buchanan House, Stirlingshire. Mr. William Burn, architect, is about erecting, in his peculiarly beautiful domestic style, a house for the Duke, on the Banks of Loch Lomond; and the gardens are to be executed by Mr. Nesfield, Landscape Architect, now at the head of his profession.

Henry Pelham Pelham Clinton, DUKE OF NEWCASTLE, Earl of Lincoln, Ranger of Sherwood Forest, Custos Rotulorum of Newark, High Steward of Retford, K.G. Residence, No. 17, Portman Square. Seat, Clumber, Worksop, Nottinghamshire. His Grace, as Earl of Lincoln, distinguished himself as Chief Commissioner of Woods and Works, in his place in Parliament, and as a senator.

Henry Charles Howard, DUKE OF NORFOLK, Earl of Arundel and Surrey, Hereditary Earl Marshal of England, Premier Peer and Earl. Residence, St. James's Square. This Mansion on the south-east corner of the square, was built in 1742 from the design of R. Brittingham, and the portico added in 1842. The Dukes of Norfolk have lived in this and the former Mansion since 1684. Country seats, Arundel Castle, Sussex; Glossop, Derbyshire; Earsham Park Farm, Suffolk. The Duke enjoys the Earldom of Arundel, as a feudal honour by inheritance and possession of the Castle, without any other creation.

Algernon Percy, DUKE OF NORTHUMBERLAND, Earl Percy, Constable of Launceston Castle, High Steward of Launceston, a Captain in the Navy. Residence, Northumberland House, Charing Cross. This edifice is of the time of James I.; built in the year 1605, and is of noble structure, fronting the street, with rich central gateway, surmounted by the Lion crest of the Percys, was called after Algernon Percy, Earl of Northumberland. Henry Howard, Earl of Northampton, Bernard Jansen, and Gerard Christmas, were, it is said, the architects. The front, 162 feet in length, the court 81 feet square. Lord Northampton willed it, in 1641, to his nephew, Thomas Howard, Earl of Suffolk, when it received the name of Suffolk House, and was so called until the marriage in 1642 of Elizabeth, daughter of the Earl of Suffolk with Algernon Percy, 10th Earl of Northumberland; Joceline Percy, Earl of Northumberland, son of Algernon Percy, Earl of Northumberland, dying in 1670 without male issue, Northumberland House, became the property of his only daughter, Elizabeth Percy, the heiress of the Percy estates. There are several pictures in Northumberland House, among them the celebrated picture of the Cornaro family by Titian. See Article "Galleries."

William Henry Cavendish Scott Bentinck, DUKE OF PORTLAND, Marquess of Tichfield, D.C.L. Residence, 19, Cavendish Square, on the west side, and is named Harcourt House. It is a dull and heavy building, with front wall and gates. The Duke is Lord of the Manor of Marylebone.

Charles Gordon Lennox, DUKE OF RICHMOND, Earl of March, an aid-de-camp to the Queen, Lord Lieutenant and Custos Rotulorum of Sussex, Colonel of the Sussex Militia, and High Steward of Chichester, Chancellor of Marischal College, Aberdeen, K.G., Duke of Lennox in Scotland, and D'Aubigny in France. Residence, No. 51, Portland Place. Seats in the country, Gordon Castle, Banffshire; Huntly Lodge, Aberdeenshire; Kinnaird, Inverness-shire; Goodwood Park and West Stoke, Sussex.

John Henry Manners, DUKE OF RUTLAND, Marquess of Granby, Lord Lieutenant and Custos Rotulorum of Leicestershire, Colonel of the Leicestershire Militia. Residence, 63, St. James's Street. Country seats, Belvoir Castle, Leicestershire; Haddon Hall, Derbyshire; Cheveley Park, Cambridgeshire.

William Amelius Aubrey de Vere Beauclerc, DUKE OF ST. ALBANS, Earl of Burford, Hereditary Grand Falconer of England. Residence, Piccadilly. Seat, Redbourn, Lincolnshire.

Edward Adolphus St. Maur, DUKE OF SOMERSET, Lord Seymour, K.G.; D.C.L.; F.R., and A.S. Residence, Park Lane, Hyde Park. Country seat, Maiden Bradley House, Wiltshire; Stover House, Devon; Wimbledon Park, Surrey. The Duke is known to have studied and distinguished himself in mathematical learning.

George Granville Sutherland Leveson Gower, **Duke of Sutherland**, Marquess of Stafford, Lord Lieutenant of Sutherland, K.G. Earl of Sutherland in Scotland. Residence, Stafford House, St. James's Park, for views of which, and an account of the Gallery of Pictures, see article "Galleries." Stafford House was built originally by Mr. Benjamin Wyatt for the late Duke of York, with money advanced for that purpose by the Marquess of Stafford, afterwards first Duke of Sutherland; the Duke of York did not live to inhabit it, and the Crown lease was sold to the present (2nd) Duke of Sutherland in 1841 for 72,000*l.*, and the purchase-money spent in the formation of Victoria Park. The upper story of this Palatial and elegant Mansion was added by the present Duke; Mr. Charles Barry, architect. The interior of this noble mansion is superior, and the most tasteful and elegant in London. The gallery is a noble room, 136 feet long, by 32 feet wide. The decorations have been of the most costly description. About a quarter of a million of pounds sterling have been spent on the edifice. The Duke pays a ground rent to the Crown of 758*l.* annually.

Arthur Wellesley, **Duke of Wellington**, Marquess of Douro, Field Marshal, Captain General, and Commander-in-Chief, Colonel of the Grenadier Guards and the Rifle Brigade, Constable of the Tower of London, Warden of the Cinque Ports, Master of the Trinity House, Lord Lieutenant and Custos Rotulorum of Hampshire and of the Tower Hamlets, Chancellor of the University of Oxford, a Governor of the Charter House, a Field Marshal of Austria, Russia, Prussia, and France, (Prince of Waterloo, and a Field Marshal in class, and a Captain General in Spain, Duke of Vittoria, and Marshal General in Portugal), K.G., K.A., B.E., C.S., E., F., M., G.F., M., I., &c., &c. Residence, Apsley House, Hyde Park, Piccadilly. Country seats, Stratfieldsaye, Hampshire, Walmer Castle, Kent.

Apsley House, the London residence, since 1820, of Field Marshal the Duke of Wellington, built originally by Henry Bathurst, Baron Apsley, Earl Bathurst, to whom the site was granted by George III., the house was originally a red brick house. In 1828, it was partly rebuilt, with an addition of a stone front portico, and the west wing, containing on the upper stories a gallery 90 feet long, by Mr. Benjamin Wyatt, architect. The Duke purchased the Crown interest in the house for 9530*l.* Subsequently, iron blinds bullet proof have been added to the windows. For an account of the Gallery of Pictures, see article "Galleries." Besides these pictures, this noble mansion contains many objects of high art, principally presentations made by the several sovereigns of Europe.

DISTILLERIES.

Distilling is a process much in use in and about London, for separating a volatile liquid from a solid or less volatile liquid, by heating the mixed substances, &c. (See article "Arts and Manufactures.") There are many distillers and rectifiers of eminence in London, viz.: Anderson and Co., Holborn Hill; Betts and Co., Smithfield Bars; Sir Felix Booth and Co., Cow Cross Street, Smithfield; Sir R. Burnett and Co., Vauxhall; Currie and Co., Bromley, Middlesex; Hodges, Church Street, Lambeth; Nicholson and Sons, St. John Street; Seager, Evans, and Co., Millbank; Smith and Co., Whitechapel Road; and upwards of 50 other respectable firms. The drinking to excess of spirits is a habit belonging much, unfortunately, to the working classes; hence so much squalid misery. The prisons and the lunatic asylums are chiefly inhabited by the victims of this vice. The houses above enumerated are to be seen by any respectable stranger who may desire to see the process and the machinery employed in the manufacture of the ardent spirit.

THE ELECTRIC TELEGRAPH

has become within the last few years so important an organ of communication, that a brief account of its present position and character in England, appears indispensable to a work of the present nature.

The telegraphic system in England has been carried out entirely by the Electric Telegraph Company (its principle office is in London), and it is therefore only necessary to describe the arrangements which it has adopted.

The Electric Telegraph Company was incorporated by Act of Parliament in the year 1846,* and immediately on its incorporation became the possessor, by purchase, of all the patents previously granted to Messrs. Cooke and Wheatstone. As these patents gave to the Company an exclusive right to the use of those essential principles on which all electric telegraphs are based, we may attribute much of the subsequent success of the undertaking to the possession of this important right. In carrying out its scheme the Company adopted the peculiar features of these inventions, as to the suspension of the conducting-wires, and the form of the instrument, which is that commonly known as the double needle telegraph.

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* An Act for forming and regulating "The Electric Telegraph Company," and to enable the said Company to work certain Letters Patent. (Short title.) The Electric Telegraph Company's Act, 9° Victoria, Cap. 44.

An electric telegraph, whatever may be its peculiar form or principle of construction, consists of three parts — the battery, the conducting-wire, and the instrument. Under these three heads the telegraph in operation in England may be therefore advantageously described. The Battery employed consists of zinc and copper plates, placed in a wooden trough divided into cells, and connected together in pairs of the two metals. The cells are then filled, between the adjacent plates, with fine clean sand, and the battery is brought into action, by moistening this sand with a mixture of sulphuric acid and water. Such a battery will continue to supply a current of electricity for several months together. It is readily portable, and in the event of its being overset or placed on one side, in carriage, no acid is spilt, nor are the plates displaced. The Conducting-wire (where placed above ground), is of iron, galvanized or coated with zinc. It is of what is termed No. 8 gauge, that is about one-sixth of an inch in diameter. Such wire is prepared in lengths of one-quarter mile each, and the successive lengths are securely joined on the line, by binding and soldering. These junctions form the knots, often seen on the wires, in passing. It is of course necessary to insulate the wires, or to extend them in such a way as to prevent the escape of the electricity from them, at any point short of that where it is required to make a signal;—that is to say, supposing it were required to send from London a signal to Birmingham: the wire must be so insulated, that when the London end receives its charge of electricity, from the battery at that station, this charge may be compelled to go all the way to Birmingham, and pass through the instrument there, before it can escape from the wire. On the railway this object is attained, by allowing the wire to rest only on pieces of glazed earthenware, which will not permit any electricity to pass through them. The wooden posts on which the wires hang are also non-conductors, or incapable of carrying away the electricity of the wire. Where the lines pass through damp tunnels, or are carried underground through the streets of towns, the wires are of copper, and are covered with Gutta Percha, India-rubber, or some resinous substances. These being non-conductors effectually prevent the escape of the electricity.

The instruments are constructed on the principle discovered by Œrsted, that a magnetic needle lying parallel to a wire, tends to place itself across such wire, when a current of electricity is passed through it; and that the direction of the motion of the needle is determined by the direction of the current through the wire. That is, supposing the needle and wire to be both placed vertically, if the needle turns from left to right when the current flows from the top of the wire to the bottom, then it will turn from right to left on the current passing from the bottom of the wire upwards.

In giving the signals, the needles do not move quite across the wires, but have their motion limited to a certain small arc, on each side of the quiescent position, by fixed stops of ivory or other substance. Were they allowed to move quite across, the oscillation before they came to rest would be so great, as to render the signalling very slow and uncertain.

The instrument used in England contains two such needles, each acted upon by its appropriate wire; which, in order that its power over the needle may be augmented, is coiled many times around it, so as to place many successive lengths of wire in close proximity to the needle. In practice, at each station to or from which communications are to be sent, there is placed one of such instruments, a battery, and a simple mechanical arrangement, termed the 'handle,' by which the attendant can with rapidity and certainty make the connection of his battery with the wires, so as to give any required signals. As each instrument has two independent needles, two wires are required to work it, one for each needle; but in a long line of wires, many successive instruments may be introduced. As, for example, between London and Birmingham, the same pair of wires actuate instruments at Euston Square, Camden Town, Tring, Wolverton, Rugby, Coventry, and Birmingham; the wires entering each station successively, to make their coils round their respective needles, and passing out again to proceed on their way to the next station. The same wire actuates a similar needle at all stations, number one wire moving the left-hand needle, and number two wire the right-hand needle at each place. The signals are given by the needles moving one or more times to the right or left hand. Thus calling the left-hand needle No. 1., and the right-hand needle No. 2., and indicating one movement to the right by the letter *r*, and one movement to the left by the letter *l*, the following table will show the signals given by each needle separately, and by the two in combination.

	No. 1.	No. 2.		No. 1.	No. 2.
A	*l l*	......	*M*	......	*l r*
B	*l l l*	......	*N*	......	*r*
C	*r l*	......	*O*	......	*r r*
D	*l r*	......	*P*	......	*r r r*
E	*r*	......	*R*	*r*	*r*
F	*r r*	......	*S*	*r r*	*r r*
G	*r r r*	......	*T*	*r r r*	*r r r*
H	......	*l*	*U*	*l r*	*l r*
I	......	*l l*	*V*	*r l*	*r l*
K	......	*l l l*	*W*	*l*	*l*
L	......	*r l*	*X*	*l l*	*l l*
			Y	*l l l*	*l l l*

The letters Q and Z are made by causing the two needles to converge either upwards or downwards thus, Q—/ \, and Z—\ /.

In order to obviate the necessity of having a clerk constantly watching each instrument, to see if signals are passing, a contrivance is made, by which the first current of electricity transmitted rings a small bell, so as to call the attention of the clerk. The bells of course ring simultaneously at all the stations through which the current passes, and the attention of all the clerks is called to their respective instruments. To prevent any mistake, as to which station is required to attend to the signal, the primary movement of the needle, (termed by French writers the 'indicative signal'), is such as to indicate, by previous agreement, the particular station whose attention is required. This one answers his 'call;' the others are free to leave their instruments until again summoned by the bell.

The communications are regularly spelt through, letter by letter, and at the end of each word, No. 1. needle is moved once to the left, by the sender of the message, signifying that the previous word is then complete. If the receiver has understood the word, he acknowledges it, by one movement of No. 1. needle to the right, meaning, 'I understand.' If by any accident he has missed the word, he moves the needle to the left, signifying thereby, 'I do not understand;' and the sender, who in all cases waits for his correspondent's return signal, at the end of each word, either proceeds with the next word of his message, or repeats the last, as the return signal requires. This might seem a very slow process; but by habit, the clerks, who are principally intelligent, well-educated lads, send and read messages at a rate which appears wonderful to a bystander.

The average speed is about twenty-five words per minute, or, assuming five letters to a word, a little more than two letters per second. But in routine despatches, which, from their recurrence every day, are pretty well known as to their general order of words, the speed is often much greater.

The following are some actual rates observed:—

		Words.	Rate per minute.	
October 13, 1849,	Irish News,	512	27	Birmingham to London.
* " "	Price of Funds,	136	45	London to Birmingham, Derby and Normanton.
November 1849,	American News,	585	29	Liverpool to London.
" 22, "	Irish News,	330	30	Birmingham to London.
March 15, 1850,	The Budget,	1742	21½	London to Southampton.
" "	"	1742	27	London to Liverpool.
* " "	"	1742	24	London to Birmingham, Leeds and Normanton.
*April 22, "	Price of Funds,	188	42	London to Birmingham, Derby, and Normanton.
July 24, "	Corn Market Report		52	Normanton to Newcastle.
August 15, "	Queen's Speech,	502	23½	London to Liverpool.
" "	"	502	26½	London to Derby.

The chemical Printing Telegraph, invented by Mr. Bain, and purchased from him by the Company, is worked between London and Manchester. This employs one wire only. The actual speed of this instrument has been observed as under:—

		Words.	Rate per minute.
October 13, 1849,	Price of Funds,	114	38.
March 15, 1850,	The Budget,	1145	13½.
August 15, 1850,	Queen's Speech,	502	20.

This form of telegraph is not so well adapted to the colloquial kind of telegraphic communication required on railways, as the needle instrument. It is therefore limited to the use of commercial lines.

We have spoken of the introduction of several stations in one and the same line of wires. But there is a practical limit to this, in the impediment which results to the communication, when more than two stations are frequently requiring to correspond at the same time. For it is obvious that only one station can use the wires at any moment. If a second, therefore, wishes to send at the same time, he must either wait till the first has finished his message, or else interrupt him.

To obviate this inconvenience, on railways where the messages are usually very numerous, the line of telegraph is divided into two or more lengths, each comprising from four to six stations, and each length terminating at some important station. The stations in each length have complete inter-communication among themselves, but cannot speak beyond their division, except by sending any message to one or other division station, for repetition onward as required. If the perfection of telegraphic communication is a more desirable object than economy of construction, a second line of wires is made to extend distinctly from end to end of the railway, with intermediate instruments at each of the division stations. These principal places can then carry on communication without interfering with the smaller stations; and orders or instructions can be distributed, or reports collected, with extreme facility, by each of the

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* The transmission of private messages is made of course only to the station required; but when public dispatches, intended for distribution to several places (such as market reports, political news, sporting transactions), are sent, they are frequently read off simultaneously, as in the cases above, by two, three, or more stations, thus reducing the time required for their distribution by enabling one sending to suffice for all the stations.

division stations taking charge of the distribution or collection, with one series of small stations.

From this arrangement arises the necessity for various numbers of wires on different lines of railway. Short lines with few stations have seldom more than two, or (if a separate wire be used for the bell), three wires. If the line be longer, so as to need division into lengths, there may be four or five wires. Over very important lines a third series of wires may be added, for conveying public messages and despatches, without interference with the railway telegraph business. Occasionally, as on the Eastern Counties Railway, between Bishopsgate and Stratford, the wires of two, three, or more converging lines are, for the sake of economy, carried for a short distance on the same timbers, thus making the number of wires over this portion of Railway amount to 8, 10, 12, or more.

The following, for example, is the distribution of the wires proceeding from the Bishopsgate Station of the Eastern Counties line:—

2	wires	for Commercial purposes, from London to Cambridge, Ely, Norwich, &c.
2	„	from London to Brandon, for the main stations on the railway.
3	„	from London to Broxbourne, and intermediate stations.
2	„	from London to Colchester, for main stations only.
3	„	from London to Chelmsford, and intermediate stations.
1	„	for a signal bell, from London to Mile End station.
1	„	for a signal bell, from London to Devonshire Street sidings and wharf.
3	„	from London to the Goods' Manager's Office, Brick Lane.
1	„	for a single needle instrument, from London to Stratford Junction.

18 wires in the whole.

Mr. Walker, the superintendent of the telegraphs on the South-Eastern Railway, has given in his excellent little work* on the electric telegraph, an analysis of the messages on railway business, which in the course of three months passed through the Tonbridge office. This analysis we subjoin.

1.	Concerning ordinary trains, . .	1168
2.	„ special trains, . .	429
3.	„ carriages, trucks, goods, &c.,	795
4.	„ company's servants, .	607
5.	„ engines, ...	450
6.	„ miscellaneous matters, .	162
7.	Messages forwarded to other stations,	499
	Total .	4110

As a supplement to the above, we may add the following analysis of messages sent and received, at the Bishopsgate Station of the Eastern Counties Railway premising that August 19 was a busy day, previous to any division of the telegraphic work, and that October 25 and 28 were ordinary days, taken at random, subsequent to the removal from the Bishopsgate Station, of all telegraphic business relating to the goods department. This is now carried on at a station further down the line.

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* "Electro-telegraph Manipulation," by C. V. Walker. Published 1850.

Subjects of Messages.	Aug. 19.	Oct. 25.	Oct. 28.
Concerning ordinary and special trains . .	66	14	19
„ cash and accounts	7	13	14
„ instructions to officers . . .	63	24	10
Inquiries on general business	35	8	21
Orders for engines, carriages, trucks, &c. . .	20	3	4
Luggage inquiries	9	1	3
Miscellaneous matters	3	1	—
Total of Messages	203	64	71
Regular daily reports concerning goods and working stock.	66	66	66
„ carriages	40	40	40
Total of communications sent and received	309	170	177

The numbers of Messages, of course, fluctuate from day to day, but the reports are liable to no such fluctuation.

Hence, taking an average from the two ordinary days, there are, during the working year of 313 days, not less than 21,000 messages and 33,000 reports despatched by telegraph, to and from this one station only. When it is considered that many of these messages are of such importance that, if not sent by telegraph, they would be forwarded by special engines; that, in many cases, the instantaneous dispatch or arrival of instructions or information may prevent serious delays, remove the necessity for heavy expenses, guard against accidents and obstructions; and that, finally, the possession of a telegraph renders the manager of a Railway, we may say, almost ubiquitous, the economy resulting from the use of the electric telegraph, in working a railway, may be imagined*.

The lines of communication through England are provided, at many points, with apparatus termed "Junction boxes," the use of which is, to enable two successive lengths of line to be either joined in one continuity, or worked in separate and independent divisions. Thus, taking the line from London to Normanton, there are junction boxes at Birmingham and Derby, so that the line may be either so arranged that London can telegraph directly through to Normanton; or it may be so divided that the parts from London to Birmingham, Birmingham to Derby, and Derby to Normanton, may be each used separately and independently. There are also "switches" provided at points where two or more lines converge, by the use of which, one line may be connected to any one of the others, so as to work with it as one line.

The telegraph extends at present over about 2353 miles of railway, in England and Scotland, involving in its construction upwards of 9500 miles of single wire. It affords the means of communication to 266 stations. Of these the most important, as London, Liverpool, Manchester, Derby, York, &c., are kept open night and day incessantly. Other and less important stations are closed at night, except on particular occasions, and under special instructions.

* Since writing the above, we have been favoured with the following return of the numbers of communications sent and received, during one year, at some of the principal stations on the Eastern Counties Railway.

Stratford	10,828
Broxbourne	16,596
Cambridge	24,000
Ely	31,460
Peterboro'	9,928
Bishopsgate	59,664
Ditto (for the public)	2,888
Brick Lane (from August to November, 1850)	6,693

The staff employed in working the telegraph, exclusive of those engaged in the preparation and manufacture of new apparatus and materials, is in number about 270. At the present time, the lines of the Company are extending rapidly, in the west and north-west of England.

Private messages may be sent either in ordinary language, or in code or cypher known only to the sender and receiver. There are fixed charges, regulated by the distance and the length of the message, for transmissions to all stations. No single message (of twenty words) is charged less than half-a-crown, or more than ten shillings, over whatever distance it may be sent; except messages relating to lost luggage, or conveying orders for beds, carriages, post-horses, refreshments, or other accommodations for travellers. Such messages, if not exceeding twenty words, are sent to any station, however distant, for half-a-crown.

The Company also undertake to make immediate payments in London, of sums of money delivered to their managers in the principal provincial towns, charging a small percentage on the sum paid, in addition to the price of the message of instructions. Bills can therefore be taken up, deposits to complete negotiations made, or remittances paid, in London immediately, by parties at distant places, who, without the agency of the telegraph, would in the delay of the post, lose the opportunities they can now secure. The same arrangements, as to payments from London to out-stations, are made with some of the principal towns.

A peculiar feature of the English telegraph has been, the establishment, in the principal towns*, of telegraphic news-rooms. Admission to these rooms is secured by a small annual payment. All the important and interesting news of the day, political movements, market reports, shipping and commercial intelligence, money and stock markets, foreign news, sporting, &c., are transmitted immediately to these rooms, and exhibited in them for the use of subscribers. Private individuals and firms, desirous of obtaining regular reports by telegraph, of markets, shipping arrivals, racing and sporting events, can procure them by the payment of an annual subscription, even in places where no news-room exists.

In most of the large towns on the telegraph lines, the wires are carried under the streets, or over the houses, into the centre of the town, so as to render the office easy of access from the principal places of business. In London a further provision is made for the accommodation of correspondents, by the establishment of branch stations, in telegraphic communication with the Central Station at Lothbury, near the Bank of England. These branches are at the Railway Station, Euston Square, at the Eastern Counties Station, Shoreditch, at the London and Brighton Station, near London Bridge, at the General Post-Office, St. Martin's le Grand, at the Waterloo Station, Waterloo Road, and at 448, West Strand. The charges for messages from these branches to out-stations, are the same as from the central office; but for messages of twenty words sent from one branch station to another a charge of one shilling is made.

Such is a brief sketch of the comprehensive system which has been the result of a few years of patient yet energetic labour; and however dazzling and brilliant other schemes may appear, we think we may assert with confidence, that there is none which presents such features of general utility, in its adaptation to all requirements, as that which is in operation in England. But far be it from us to say that here we shall rest, for where so much has been done, it may be confidently anticipated, that each year will enlarge the field of the Company's operations, will bring new and improved agencies into play, and will place the use of this wonderful power more within the reach of every one. The public have a right to expect that this should be the case, and we believe that they will not be disappointed.

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* Glasgow, Edinburgh, Newcastle, Leeds, Hull, Liverpool, Manchester, Stockport.

EDUCATION.

Some account of the numerous schools that exist in our neighbourhood, must be interesting in a statistical point of view, as well as to show to what extent these seminaries and colleges for instruction exist, and how much, as a return, we ought to expect and hope of the conduct of the growing youth. This list does not include the very extensive educational schools attached to the numerous parishes of the City of London, City of Westminter, and the County of Middlesex, nor is any account added of the extensive establishments that abound as day-schools, and boarding-schools for both sexes, in the neighbourhood of London. (See also articles "Asylums," "Charities.")

Archbishop Tenison's Grammar School, 1685.

Aske's Hospital, education of 20 boys.

Associated Catholic Charities for the education, clothing, &c., 1500 children, Great Windmill Street.

Bayswater Episcopal Chapel Female Orphan School, 1839, Bedford Place, Kensington.

Benevolent Society of St. Patrick, for clothing and educating the children of the Irish poor, 1784, Stamford Street, Blackfriars.

Blue Coat School, Westminster, 1688.

British and Foreign School Society, 1808, Borough Road, Southwark.

British Union School, Shakspeare's Walk, Shadwell, 1816.

Burlington School, School House, 1699, Boyle Street, Regent Street.

Camberwell Free Grammar School, 1615.

Camberwell National School, 1615, Grove, Camberwell.

Charter House School, Thos. Sutton, 1611.

Christ Hospital, Newgate Street, 1552.

Church of England Sunday School Institute, 1843, 169, Fleet Street.

Church of England Metropolitan Training Institution, 1849, Highbury.

Church of England Society for educating the poor of Newfoundland and the Colonies, 1823, 14, Chatham Place.

City of London School of Instruction and Industry, 1806, Mitre Street, Aldgate.

City of London School, 1835, Honey Lane Market, Cheapside.

Clerical Education Aid Fund, 1845, Sergeants' Inn.

Cottage School Charity, 1848, St. Stephen's, Colman Street.

Commercial Travellers' School, 1847, Wanstead.

Congregational School, 1811, Lewisham.

Congregational Board of Education, 1843, Liverpool Street, Finsbury.

Corporation of the Royal Caledonian, for the education and support of the children of soldiers, sailors, and marines, of natives of Scotland, 1813, Copenhagen Fields.

East India College, Hertford, 1805.

East India Military Seminary, Addiscombe, 1809.

East London English and Irish Schools, 1817, Goodman's Yard, Minories.

German School, 1743, Savoy, Strand.

Green Coat School, or St. Margaret's Hospital, 1623, Tothill Street, Westminster.

Great Coat School, Westminster, for 67 boys and 33 girls, 1706.

Hans' Town School of Industry, 1804, Sloane Street.

Harrow School, Middlesex, 1571.

Hickson's Grammar School, 1686, All Hallows, Barking.

Highgate Grammar School, 1565, 40 scholars out of Highgate, Holloway, Hornsey, &c., Highgate.

Home and Colonial Infant School Society, 1836, St. Chad's Row, Gray's Inn Road.

Irish Society of London, for the education of Native Irish through their own language, 1822, 32, Sackville Street.

Islington Proprietary School, 1830, Islington.

Jews' Free School, 1817, Bell Lane, Spitalfields.

Jews' Gates of Hope, and other Charity Schools, 1831, Bevis Marks.

King's College, 1829. See article, "Colleges."

Ladies' Charity School, for educating and clothing 51 poor girls, 1702, 30, John Street, Bedford Row.

Ladies' College, 47, Bedford Square. The pupils are under the management of a committe of lady visitors. Particulars are given at the college.

Lady Alice Owen's School, 1613, Islington.

Lancasterian Schools, instituted in 1798, by Joseph Lancaster, are established in several parts of London. The central school, Baldwin's Gardens, Gray's Inn Lane, for 600 boys and 400 girls.

Licensed Victuallers' School, 1803, Kennington Lone.

London Diocesan Board of Education, 79, Pall Mall, 1839.

London Hibernian Society for Education, &c., 1806, 29, Southampton Street, Covent Garden.

London University College, 1825, 29, Southampton Street, Covent Garden.

Lords of the Committee of Council on Education—Lord President of the Council, Lord Privy Seal, Earl of Carlisle, Earl of Clarendon, Lord John Russell, Sir George Grey, Bart., Right Hon. T. B. Macaulay, The Chancellor of the Exchequer—Assistant Secretary, and 20 inspectors. Architect, Mr. Westmacott.

Mercers' Grammar School, 1522, College Hill.

Marine Society, for the equipment, maintenance, and instruction of poor boys, 1756, Office, 98, Gracechurch Street Within.

Merchants' Seamen's for board, clothing, and education of Orphans, Office, 98, Gracechurch Street.

Merchant Tailors' School, 1561.

Metropolitan Schools of the British and Foreign Society, consist of 117 schools, with about 20,000 scholars, of both sexes.

Middlesex Society, for educating poor children, 1781, Cannon Street Road, St. George's.

National Society, for the education of the poor in the principles of the Established Church, 1811, Sanctuary, Westminster.

Orphan Working School, for instruction, &c., 1758, Haverstock Hill, Hampstead.

Orphan Working School, for the education and support of orphan children, 1760, City Road.

Palmer and Hill's Grammar School, 1655, Tothill Street.

Patrons of the Anniversary of the Charity Schools, 1704, Basinghall Street.

Philological School, for the education of the sons of clergymen and other professional men, 1792, Gloucester Place, New Road.

Protestant Dissenters' Charity School, 1717, Bartholomew Close.

Quakers' School, Goswell Street Road.

Queen's College, for general female education, 1848, 67, Harley Street.

Queen's College, city branch, Artillery Place, Finsbury Square.

Raine's, for educating and Clothing 100 children, 50 boys and 50 girls, 1719, Old Gravel Lane, St. George's in the East.

Ragged School Union, 1844, Exeter Hall.

Rich's Grammar School, 1672, Lambeth.

Royal British Institution, 1813, North Street, Finsbury Square.

Royal Freemasons' School, for maintaining, clothing, and educating female children, 1788, Westminster Road.

Royal Masonic Institution, for clothing, educating, &c., sons of indigent and deceased freemasons, 1798.

Royal Naval School, for educating, boarding, and clothing sons of naval and marine officers, 1833, New Cross.

Royal Naval Female School, for the daughters of naval and marine officers, 1840, Richmond, Surrey.

School for Indigent Blind, 1799, St. George's Fields.

School of Industry, for female orphans, 1786, Church Street, Paddington Green.

Smith's Grammar School, 1693, St. Lawrence, Jewry, Milk Street.

Society for the Support and Encouragement of Sunday Schools, 1785, 60, Paternoster Row.

St. Anne's Society Schools, Aldersgate and Peckham.

St. John's Servants' School, 1842, New Ormond Street.

St. Margaret's Hospital, Westminster, for 24 boys, founded by Charles I.

St. Olave's and St. John's Grammar School, 1571, Bermondsey Street, Southwark.

Stepney Free School, 1540, Ratcliffe.

St. Paul's School, St. Paul's Church Yard, founded in 1509, by Dr. John Colet, Dean of St. Paul's, for the education of 153 boys.

St. Peter's College, Dean's Yard, Westminster, 1560, for 40 foundations.

Sunday School Union, 1806, 60, Paternoster Row.

St. Saviour's Grammar School, 1522, Southwark.

Trotman's School, 1663, Bunhill Row.

Voluntary School Association, 1849, New Broad Street.

Welsh Charity School, for educating 130 boys, and 70 girls.

West Metropolitan Jewish School, 1845, 65 boys, school, 256, High Holborn; 30 girls, school, 12, Little Queen Street.

Western Jewish Girls' Free School, 1846, Dean Street, Soho.

Western Jewish Free School, for boys, Greek Street, Soho.

Westmoreland Society, 1746, for clothing, maintaining, and educating the children of parents born in Westmoreland, Bread Street, Cheapside.

Yorkshire Society School, 1812, Westminster Road.

MECHANICAL ENGINEERING WORKSHOPS

Exist to some magnitude in London, particularly on the banks of the Thames. A trading, manufacturing, and enterprising population must, by their continuous requirements, afford great scope for the making of steam-engines and the numerous other mechanical contrivances essential to the progress of commerce, and to minister to the luxury of the age: moreover, the great extent of steam navigation, by the communications of the port of London with all parts of the world, and the great passenger traffic on the Thames, add considerably to the advantage of engineering works, and the employment in the workshops established on the banks of the Thames. A few names of firms are selected out of a numerous list, whom the learned and scientific stranger may make application to and visit with advantage; and those who desire to enter into the relations of trade may in perfect safety do so with honour and reciprocal advantage to each.

Boulton, Watt & Co., Office, London Street, Fenchurch Street. (The present firm is designated Messrs. James Watt & Co.) This firm can boast of its foundation from that of the great James Watt. Its business is now that of constructing the largest marine engines. Mr. James Brown, one of the partners, has been in the firm a great many years, and is particularly skilled in designing steam vessels, iron and timber, and successfully apportioning tonnage to power both for war and commerce.

Beale (John T.), East Greenwich, Engineer, has successfully constructed rotary engines; has had several boats on the Thames working profitably, and with speed, with boats of light tonnage; is a good chemist, and of extensive research.

Blyth (J. and A.), Fore Street, Lambeth, engineers of much repute for marine and other engines, and for machinery used in the West Indies.

Ditchburn (T.), Blackwall, a most successful constructor of fast iron vessels; is known and considered to be one of the cleverest shipbuilders in England.

Donkin (Bryan) & Co., Works, Blue Anchor Road, Bermondsey. Great millwrights, also mechanical engineers generally.

Easton & Amos, Great Guildford Street, Southwark Bridge, principally for waterworks, makers of the hydraulic or hydrostatic presses, for the Conway and Britannia bridges, on the Chester and Holyhead Railway, under the direction of Mr. Robert Stephenson.

England (Geo.) & Co., Hatcham Iron Works, Old Kent Road. Manufacturer of the light locomotive engines which have proved successful.

Fox, Henderson & Co., Office, New Street, Spring Gardens, contractors; constructors of some of the largest works in the kingdom. Mr. Fox is a man of great eminence in mechanics. The firm have very extensive iron works near Birmingham; have constructed the Great Exhibition Palace of Glass and Iron in Hyde Park.

Gordon, Christy & Co., Rotherhithe Street, Rotherhithe, general engineers, constructers of machinery, large and small. Convenient premises for business on the southern bank of the Thames. It is an old firm, lately joined by Mr. Gordon, with an increased and ample capital for the execution of large orders for home and foreign service.

Hall (John and Edward), Office, 23, Lombard Street, celebrated for mill machinery and steam engines; manufactory, Dartford, Kent.

Hocking (Samuel), Adelphi, contractor and maker of Cornish engines for mining and pumping purposes; is a man of considerable information in the economy and working of Cornish engines, and for working expansively, and the saving of fuel.

Holtzapffel (Mrs.), 54, Charing Cross, and 127, Long Acre, widow of the late Mr. Holtzapffel, author of a talented work on tools; is known and esteemed for lathes for turning, and tools generally.

Joyce (Messrs.), Greenwich Iron Works, justly esteemed for engine works, particularly for marine engines; recently successfully constructed and launched an iron vessel, to run from London to Boulogne, and is the first launch ever effected at Greenwich.

The engineering establishment of Messrs. **Maudslay, Sons, & Field**, situated in the Westminster Road, Lambeth, is the most extensive manufactory for steam-engines and general machinery in London. It is abundantly stocked with tools and machines of the highest order, employing upwards of 1000 workmen. It was founded about 1800, by the late Mr. Henry Maudslay, whose original genius and mechanical talent carried him far in advance of the period in which he lived, and led him to improve almost all the tools and expedients then in use for executing mechanical and engineering work. He used the sliding rest in the lathes of his manufactory, and greatly improved screws of every kind, especially the working taps and dies, adopting a regular proportion between the threads and diameters of all sizes, from 6 in. diameter down to those used by watchmakers. Mr. Maudslay was early employed by the Admiralty, and executed from 1804 to 1810 the block machinery invented by the late Sir Isambard Brunel; these machines are still fine specimens of workmanship, and embody nearly all the improvements now so general in our manufactories, such as the self-acting principle in turning, both for face and cylindrical work, the mortice, slotting, and drilling machines. When steam navigation was introduced, Mr. Maudslay directed his attention to it, and in 1817 constructed the first steam-boat engine at Lambeth; since which time, marine engines have been the staple manufacture of the establishment. In 1823 the machinery of the "Enterprize," which made the first steam passage to India round the Cape of Good Hope, and in 1838 the engines of the "Great Western," the precursor of transatlantic navigation, were constructed at these works. At the present time engines of the greatest power yet made are in progress. All the processes of casting in iron and brass, forging, boring, turning, and boiler-making are carried on at this manufactory, which is conducted by Messrs. T. H. and Joseph Maudslay (sons of the late Mr. Henry Maudslay) and Mr. Field, who are patentees of some of the most approved arrangements and details of marine steam-engines.

Mare & Co., Engineers of iron vessels, and for iron work of bridges.

Miller, Ravenhill & Co., Blackwall, are most extensively engaged in the construction of marine engines and iron boats; have been much employed by public companies and foreign governments.

Napier (D.), York Road, Lambeth; engineering generally, but particularly for cylinder printing machines, and for the machinery used in the Arsenal at Woolwich.

Penn (John), of the firm of William Penn and Son, Greenwich, very highly celebrated for his oscillating cylinders, most extensively engaged for marine engines, has made them for British and foreign governments, and for public companies; his works are most capacious, and he has made more of this kind of engine, than other firms.

Rennie (Messrs. Sir John and George) & Co., Holland Street, Blackfriars. Very large works, extending to the Thames, near Blackfriars Bridge, eligibly situated; are justly appreciated for great works, executed for Government in the Dock Yards, for mill machinery, for harbour and canal works, lockgates and works of great magnitude: have been much employed by the Emperor of Russia, and have successfully made marine engines fitted with the screw and paddle. They were engineers of London Bridge, for which Sir John received the honour of knighthood. Mr. George Rennie is esteemed for his high scientific attainments. They are Vice Presidents of the Royal Society.

Robinsons & Russell, Mill Wall, Poplar, marine engine makers, iron boat builders, extensively engaged in these services, as well as making steam machinery for sugar works, for the East and West Indies. It is also a house of increasing business, in addition to carrying out Mr. Scott Russell's (one of the partner's) wave principle, in the displacement, for speed and safety in ship building.

Seaward (John) **Capel & Co.**, Canal Iron Works, Poplar. Great marine steam engine makers; have worked considerably for the English and foreign governments. Mr. John Seaward has very high attainments in mechanical science; is the inventor of the cycloidal paddle wheel.

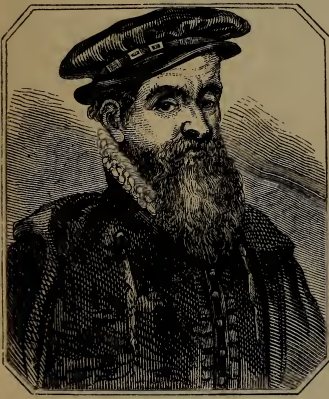
Spiller (Joel), Battersea, known for his boilers and engineering generally.

Stephenson (Robert & Co.) Private Office, 24, Great George Street; Office of Company, Mr. Starbuck's Chambers, No. 2, Walbrook; one of the earliest and most extensive makers of the locomotive engines in the world; has several patents, is known for high qualities and his great attainments in mechanics; is member of Parliament for Whitby in Yorkshire.

There are numerous other firms engaged in mechanical engineering in and about the metropolis, for whose addresses we would refer to Kelly's London Directory.

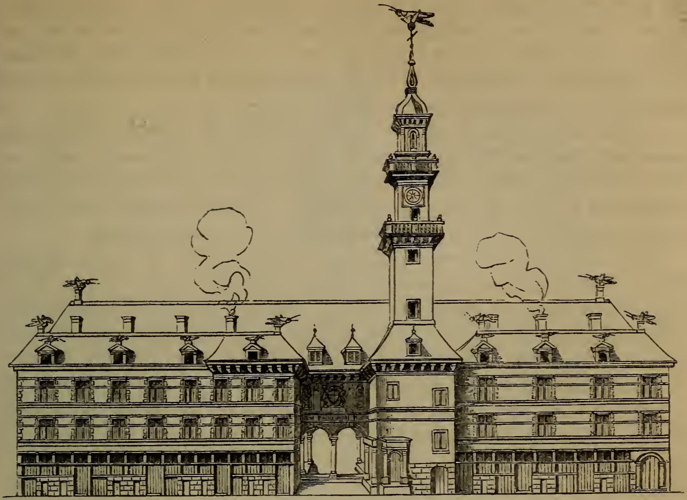
NEW ROYAL EXCHANGE.

This building stands on the site of the original bourse built by Sir Thomas Gresham in the reign of Queen Elizabeth, and presented by him to the merchants of London. Up to that period the merchants had been accustomed to meet in the open air, in Lombard Street, exposed to all the inclemencies of our uncertain climate—or, perhaps, partially and occasionally in the nave or aisles of Old St. Paul's Church, then the common mart for all "carriers of newes," and called the "Walkes of Powles."


SIR THOMAS GRESHAM

Sir Thomas Gresham was one of a race of merchants, and having been much employed by Queen Elizabeth in the Low Countries in conducting loans, purchasing armour and provisions for her armies, and in negotiations with the governors of these countries, had doubtless experienced the great conveniences derived from the bourses of Antwerp, and other cities of the Netherlands. With this conviction he proposed to the lord mayor and aldermen of London, in 1563, to build them a bourse if they would provide a site for it. This offer was accepted in 1564, and in 1565 the ground was bought at a cost, as appears by the city records, of 3737*l.* 0*s.* 6*d.*, the principal part of which was contributed by the donations of the twelve companies, assisted by no less than 715 citizens. On the 7th of June, 1565, the first stone was laid by Gresham himself; and such was the expedition used, that it was completed so far as to be opened at the end of the following year. There are many prints extant of this building, by Hollar and others, and it is clear that it was built after the model of the bourse of Antwerp, which is still in existence, and which, doubtless, it much resembled (*vide* woodcut opposite).

This building was at first called "Britain's Bourse," but in 1569 Queen Elizabeth honoured Gresham with her royal presence at dinner at his house in Threadneedle Street, and having visited the bourse afterwards, commanded it to be called the "Royal Exchange," by which name this edifice has been ever since distinguished. On the death of Sir Thomas Gresham, which happened on the 21st of Nov., 1579, he left this building in trust to the Corporation of London, and the Mercers' Company, for the purposes of maintaining the Royal Exchange, for founding and endowing a college to be called Gresham College, on the site of his own dwelling-house, and for the support



FIRST ROYAL EXCHANGE.

of certain almshouses. Through all the changes of the times since this period, this trust has continued to be faithfully executed by these two corporations, though they have been, and still are, enormous losers thereby. Gresham College, as a college, has ceased to exist, but the Gresham lecturers are still maintained and paid, and the lectures duly delivered, "during term," in a new building situated near Guildhall, and erected at a cost of upwards of 15,000*l.*

Gresham's Exchange fronted Cornhill, and occupied about the area of the edifice which followed it. It continued until the great fire of London in 1666, when it was entirely destroyed, nothing remaining but the statue of its founder, which escaped the flames uninjured.

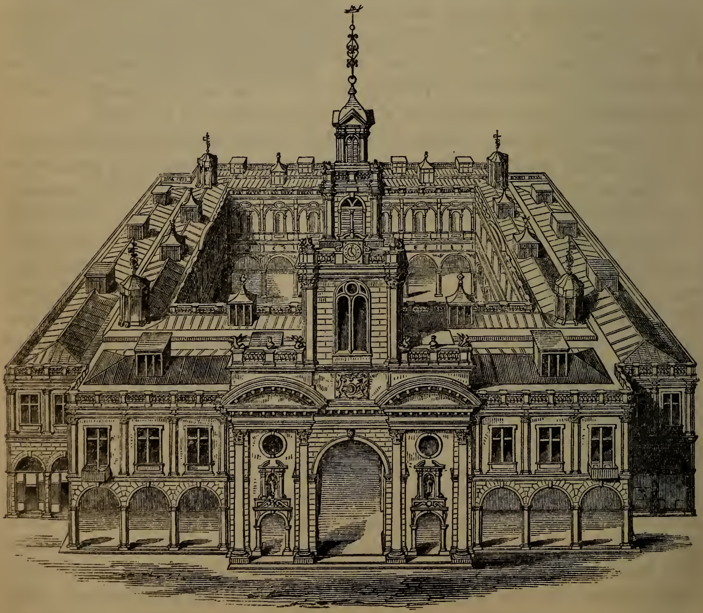
Immediately after the fire of London steps were taken by the citizens to rebuild this important edifice, and as early as April, 1667, Edward Jerman, one of the city's surveyors, was appointed the architect. He immediately began to clear the site, which was considerably improved; the design was approved of by King Charles II. on the 21st of September following. The first stone was laid on the 6th of May, 1668, and on the 28th of September, 1669, the second Royal Exchange was opened in due form. This building was in a peculiar style, and was a good deal admired (see woodcut, p. 368), but it was sadly encumbered by shops and buildings, which hemmed it in all round. The first tower was of wood, which, having become decayed, was taken down and a new one of stone erected in 1821, from the designs of Mr. Smith, the surveyor to the Gresham Commission. This tower was composed in a later Italian style, and was considered a great incongruity, and vastly inferior to the characteristic boldness of the old tower. The interior area of this Exchange was light and graceful, the arches of the arcades springing from the tops of columns of the Tuscan order. Above these was a second story, much overloaded by a series of apocryphal statues of the kings of England, in niches, from William the Conqueror downwards. These statues were carved in stone, and generally in the worst possible taste.

In the centre was a statue of Charles II., in marble, which was preserved, and is now placed in a niche in the south-east angle of the merchants' area. The statue of Sir Thomas Gresham was also saved, and is now in Gresham College. All other statues and decorations perished in the fire that destroyed this second edifice.

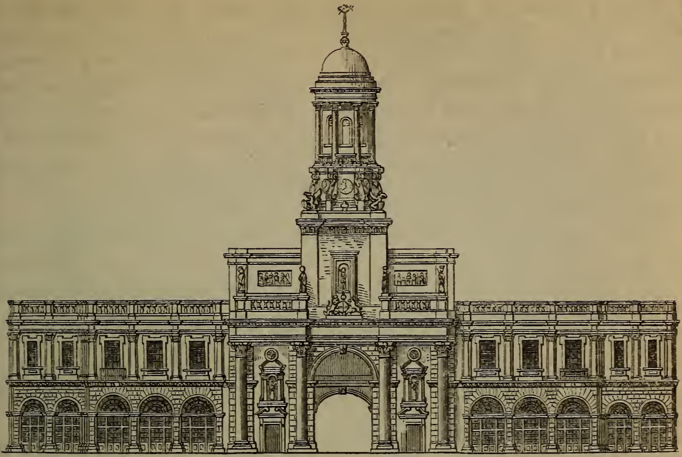
This fire happened on the 10th of Jan., 1838: it began shortly after ten o'clock at night, and before three o'clock next day the whole pile was a heap of smoking ruins, except the tower, which, with the clock faces pointing by the hands to twenty-five minutes past one, remained for some months to remind the citizens of London of their misfortune, and the exact moment of its greatest extremity.

Having thus slightly sketched the history of the Royal Exchange, from its original foundation by Gresham to its second destruction, it only remains to describe very shortly the circumstances under which the present magnificent structure was reared, and to give a slight description of it, accompanied by a view and two plans.

As soon after the fire as was practicable, application was made to Parliament for powers to improve the site of the intended new build-



BIRD'S-EYE VIEW OF THE SECOND ROYAL EXCHANGE.



ROYAL EXCHANGE, AS ALTERED IN 1821.

ing, and to raise funds for that purpose. With these objects in view, the Act of the first and second of the present Queen, chap. c., was passed, and received the Royal assent on the 10th of August, 1838. By this Act, power was given to purchase and remove all the buildings west of the old Exchange, called Bank-Buildings, and also the old buildings to the eastward, extending nearly to Finch-Lane, and to raise the sum of 150,000*l*., upon the credit of the London-Bridge Fund, to cover the attendant expenses.

After the passing of this Act, the Corporation proceeded to purchase the property, which operation was completed in the course of the year; and much having been done, the Gresham Committee took the first step towards the building of a new Exchange, and on the 14th of March, 1839, they directed a plan of the site to be prepared, and appointed a Sub-Committee to draw up instructions to the Architects. This Committee reported on the 26th of the same month, and an advertisement followed, offering three premiums of 300*l*., 200*l*., and 100*l*. respectively, for the three best designs. The instructions were very minute, the cost of the building being limited to 150,000*l*.

The designs delivered in on the 1st of August following, amounted to upwards of fifty; and the Committee resolved to call in the assistance of three eminent architects to assist them in their judgment as to the best design. The architects, from whom it was proposed to choose those who should undertake this duty, were—

Mr. Charles Barry,
Mr. Edward Blore,
Mr. Charles Robert Cockerell,
Mr. Joseph Gwilt,
Mr. Philip Hardwick,
Sir Robert Smirke,
Mr. William Tite.

Upon a ballot, Sir Robert Smirke, Mr. Barry, and Mr. Hardwick were chosen. Mr. Barry declined to act, and Mr. Gwilt was appointed in his stead. On the 2nd of October, these three gentlemen reported to the Committee that they considered the designs marked respectively 36, 43, and 37, the best within the limits prescribed by the conditions, and named five others as deserving of approbation; but they further reported to the Committee, that they could not recommend either of them as practicable, advisable, or capable of being advantageously adopted.

After considerable discussion and the loss of much valuable time in consequence of this unexpected result, on the 3rd of February, 1840, the Committee resolved to adopt the principle of a limited competition between five architects, to be named by ballot. The architects named in consequence were Sir Robert Smirke, Mr. Gwilt, Mr. Tite, Mr. Barry, and Mr. Cockerell. Of these five, three declined the competition, leaving it between Mr. Tite, and Mr. Cockerell.

On the 27th of April the designs prepared by these gentlemen were delivered, with full statements of their views and purposes in their respective designs, and estimates of the cost.

On the 7th of May, the Committee met to decide on the merits of the two designs then before them, when Mr. Tite's was preferred by a majority of thirteen to seven, and he was appointed architect accordingly.

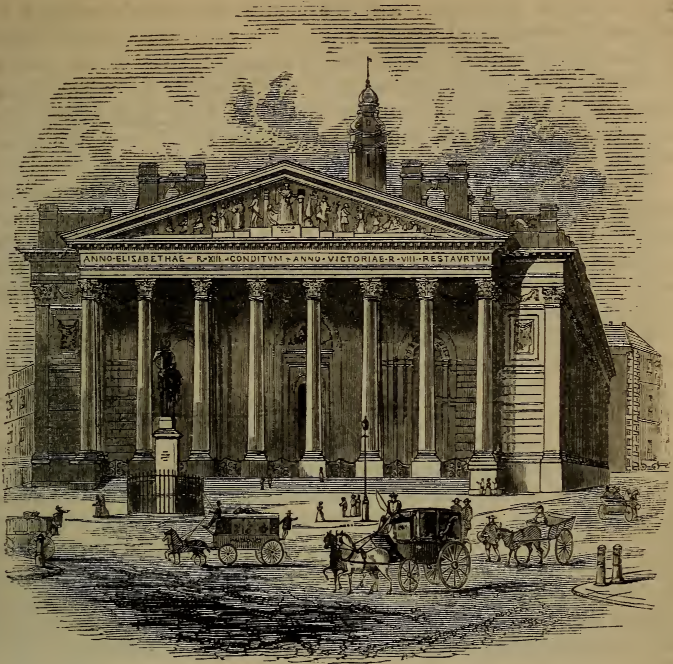
Some farther delay occurred in obtaining the sanction of the Lords of the Treasury to the design, and in the necessary formalities of the approbation of the Court of Common Council and the Court of the Mercers' Company; but at length, on the 30th of September, the architect received instructions to proceed to invite tenders for the foundations.

On the 16th of October, 1841, tenders were delivered from twelve builders, and the contract for the foundation was given to Messrs. Robert and George Webb, at the sum of 8124*l.*

Thus, after an interval of no less than four years, this work was fairly commenced, and the citizens of London were delighted at last to see the ruins and rubbish of the old building disappearing before the labours of the workmen.

The work was carried on with unceasing diligence, and everything was soon in readiness for formally "laying the Foundation Stone," which took place on Monday the 17th of January, 1842. Prince Albert condescended to perform this ceremony, which was very interesting, and the whole circumstances connected with it were described on the Plate laid in the Foundation Stone, on which was engraved, in Latin and English, an appropriate inscription.

The contract for raising the superstructure was taken by Mr. Thomas Jackson, who, previously, had been largely engaged in the construction of the Birmingham and other of the northern railways, one of his more important buildings being the great station at Derby.


ANNO·ELIZABETHAE·R·XIII·CONDITVM·ANNO·VICTORIAE·R·VIII·RESTAVRTVM

NEW ROYAL EXCHANGE.

The New Royal Exchange was completed in the unprecedentedly short period of three years, at somewhat below the architect's estimate of 137,600*l*., or, including Sculpture, Architect's Commission, and other Expenses, at a total of about 150,000*l*. The building was formally opened by Her Gracious Majesty Queen Victoria, in Oct., 1844, and was finally given up to the merchants on the 1st of January following.

This Edifice stands nearly due east and west; the extreme length from the portico on the west to the columns on the east is 308 ft. The plan is much broader at the east end than the west, the width of the portico being 96 ft., the extreme width of the west end 119 ft., and of the east end 175 ft. The dimensions of that part appropriated for the meeting of the merchants, is an area of no less than 170 ft. by 112 ft., of which 111 ft. by 53 ft. are uncovered and open to the sky.

The diameter of the columns is 4 ft. 2 in.; their height, including the base and capital, 41 ft.; the extreme height to the apex of the pediment at the west end, 74 ft.; and the height of the tower at the east to the top of the vane, 177 ft.

The general disposition of the plan is as follows:—At the west end is a portico of eight Corinthian columns, with two intercolumniations in actual projection, and the centre part deeply recessed in addition. The principal western entrance is under this portico, which is ascended by thirteen granite steps from the level of the street. The whole west end is appropriated to the offices of "The Royal Exchange Assurance for assuring Shipping, Fire, and Lives," the entrance to their offices being on the right and left of the great western entrance.

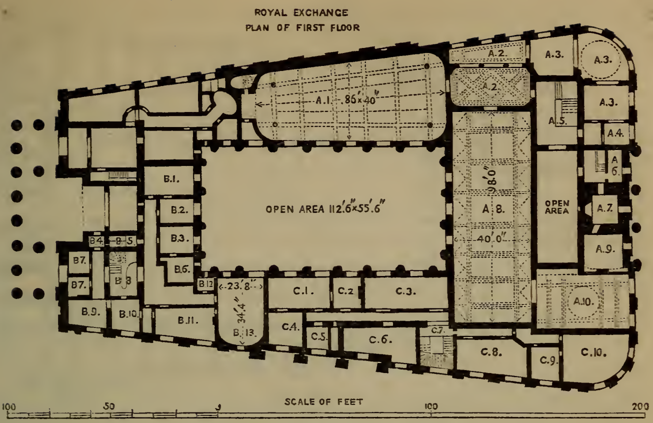
The great eastern entrance is under the tower. After passing through it, there is a small area for giving light and air to the inner mass of that part of the building; and at the north end of this area is the entrance to the important establishment of Lloyd's. At the centre of the building, on the north and south, there are also entrances to the merchants' area.

The south front is an unbroken line of pilasters, with rusticated arches on the ground floor for shops and entrances, the three middle spaces being deeply recessed; over these are richly-decorated windows, and above the cornice there are a balustrade and attic.

The north side differs considerably from the south; for in this case the centre projects, and the pilasters are omitted at the end spaces. The arches of the ground floor are rusticated, and the same windows occur above as on the south side, but with two exceptions, which are formed into niches. In one of them is a statue of Sir Hugh Myddelton, by Joseph; and in the other one, of Sir Richard Whittington, by Carew. The former worthy citizen is celebrated for having brought the New River to London; and the latter, a merchant and a mercer, founded and endowed some of the noblest charities of the city.

The east front is marked in the centre by four Corinthian columns, from which rises the tower. The first story of the tower is square, with ornamental pilasters; at the angles, on the east front, is a niche. in which is placed a statue of Sir Thomas Gresham, by Behnes: above this is an attic for the clock faces. The next story of the tower is circular, decorated with Corinthian columns, and crowned by a dome carved with leaves. The vane is the famous grasshopper that was on the old Exchange; it was not much injured by the fire, and has been restored. It is of copper gilt, and is 11 ft. long. In the tower is a peal of fifteen bells for the chimes, cast by Mears; and the clock was constructed by Mr. Dent, the eminent clockmaker of the Strand, under the direction of Professor Airey, the Astronomer-Royal, and the first stroke of each hour is true to a second of time. The citizens are thus enabled, by this exertion of mechanical skill, to obtain the exact time in London with as much accuracy as could be obtained by a visit to the Observatory at Greenwich. The bells have unhappily proved unsuccessful, and though the peal has been cast twice, they are still not sufficiently in tune to be used for any purposes except striking the hour and chiming the quarters.

The one-pair, or principal floor, is occupied by four series of apartments; the principal of these, it has been seen, is appropriated to the

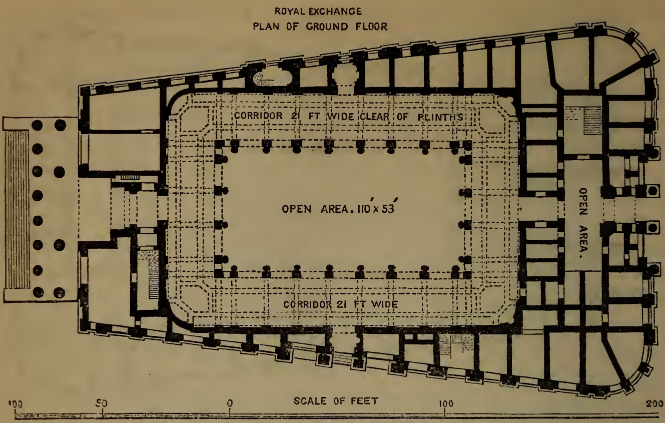


PLAN OF FIRST FLOOR OF ROYAL EXCHANGE.

Underwriters' establishment of Lloyd's (see above). Lloyd's occupies all the east end, and a principal part of the north side. The greater part of the west end is appropriated to the Royal Exchange Assurance Offices. The south side is principally occupied by the ancient corporation of the London Assurance, having an entrance and offices on the same side on the ground-floor; and on the remaining part of the south and west is a suite of offices, originally intended for the lecture-rooms and offices of Gresham College, but at present unappropriated.

The offices of the Royal Exchange and London Assurance consist of board-rooms, secretaries' offices, and all the usual arrangements for such establishments, on the most liberal and extensive scale; having, in addition, a series of apartments in the mezzanine or entresol. In many cases, the rooms on the second floor are lighted from the roof; and strong-rooms, vaults, and other apartments are provided in the basement story.

Lloyd's contains several magnificent apartments; the staircase is very convenient, and even grand in its arrangements, the steps being 14 ft. wide each, of Craigleith stone, in one length. The subscribers' room for the business of underwriting is 100 ft. long by 48 ft. wide. This noble apartment runs from north to south, on the east side of the quadrangle, or merchants' area; attached to this is a library or reading-room, with a gallery round, furnished with maps and charts. The captains' room, the board-room, and the clerks' offices, occupy the eastern end. Along the north front is another spacious chamber, called the commercial room, 80 feet long, which is intended as a sort of commercial club-room for all strangers visiting London for purposes of business. These large apartments are lighted from the cielings, and also from windows opening into the merchants' area. They are highly decorated, consistently with their purposes, well



GROUND PLAN OF ROYAL EXCHANGE.

warmed and ventilated, and are certainly the finest rooms of their kind in the city of London.

The ground-floor of the Exchange (see above), like Sir Thomas Gresham's Exchange and the one last destroyed, is appropriated mainly to shops and offices. Each tenement or shop is complete in itself, having, in addition to the ground-floor, a room over, and a basement beneath, separated by party-walls and brick arches of great strength, from their neighbours, and from such apartments as may happen to be over them. The same arrangements for preventing the spread of fire apply to the other divisions of the building; so that it seems impossible that a calamity similar to that which has twice destroyed the Royal Exchange can again occur. A single shop, or even one of the larger divisions of the building may be burned, but the fire must be limited and confined to that portion of the structure where it happens; and in this sense the present building is fire-proof. There is on the frieze of the portico the following inscription, recording the foundation of the original building in the 13th year of Queen Elizabeth, and its restoration in the 7th of Her present Gracious Majesty:—

"ANNO XIII. ELIZABETHÆ R. CONDITUM. ANNO VIII. VICTORIÆ R. RESTAURATUM."

Occupying the key-stones of the three great arches, there are in the centre the merchant's mark of Gresham; and on the key-stones of the side arches the arms of the merchants adventurers of his day, and the staple of Calais. North and south of the portico, and in the attic, are the emblems of the city—the sword and mace—with the several dates of Queen Elizabeth's reign and the present year; and, in the lower panels, mantles containing the initials of Queen Elizabeth and Queen Victoria, respectively. Over the three centre arches, on the south side, are the arms of Gresham, the city, and the Mercers' Company; and the same arms are repeated at the east end on the entablature. Over the three centre arches of the north front are the following mottoes, viz. in the centre, that of Sir Thomas Gresham, in old French, *Fortun-à-my;* on the dexter side, the city motto, *Domine dirige nos;* and, on the sinister, the motto of the Mercers' Company, *Honor Deo.*

Sculpture over the Pediment.—At the west end, the tympanum of the pediment is adorned with sculpture, by Mr. Richard Westmacott, A.R.A., consisting of allegorical representations of commerce, exhibiting the English merchant in some few of the numerous interesting positions which it is his high destiny to occupy, in transacting, it would scarcely be too much to say, the business of all the earth.

Having described the external appearance of the new Exchange, it only remains to notice the interior. Here we find an open court, something like the cortili of the Italian palaces. The ground-floor consists of Doric columns and rusticated arches; over them is a series of Ionic columns, with arches and windows, surmounted by a highly-ornamental pierced parapet. The effect of this court is very light, magnificent, and ornamental, but still consistent with its uses and purposes. The key-stones of the arches of the superior story are decorated with the arms of all the nations of the world, in the order determined at the Congress of Vienna, and the arms of England are in the centre of the eastern side.

The ambulatory, or merchants' walk, is very spacious, and well sheltered. The ceiling is divided by beams and panelling, highly painted and decorated in encaustic by Frederick Sang. In the centre of each panel, on the four sides, the arms of the nations are repeated, emblazoned in their proper colours; and in the four angles are the arms of Edward the Confessor, Edward III., Queen Elizabeth, and Charles II. In the north-east angle is a statue of Queen Elizabeth, by Watson; and, in the south-east, a marble statue of Charles II., which formerly stood in the centre of the old Exchange.

In eight small circular panels in the ambulatory are introduced the arms of the three mayors, viz. Pirie, Humphrey, and Magnay, and also those of the three masters of the Mercers' Company, Pooley, Sutton, and Watney, who had respectively held office during the erection of the building.

The arms of the chairman of the Gresham Committee, Mr. R. L. Jones, and of the architect, Mr. Tite, complete the heraldic embellishments. The ambulatory is paved with Yorkshire stone, marked out into panels by margins and lines of black stone, called Castle Hill, with squares of red Aberdeen granite at the intersections.

The open area is paved with the paving-stones from the old Exchange, laid in patterns, with bands of red granite. The old paving is said, traditionally, to be of Turkey stones, presented by some

Levant merchant; it is difficult to say whether this is true. The stones themselves seem to be very compact sandstone, full of grains of mica and silex, but certainly not what is usually understood by Turkey stone.

Having thus completed our account of this great national and municipal work, we may add, that though it has been exposed to most severe and violent criticism, it appears now to be universally conceded that the design is conceived and carried out in a massive and vigorous style; that there is great variety and richness in the decorations; and that the portico, if equalled, is certainly not excelled, by any modern European example. The great depth obtained by recessing the centre under the portico, and the boldness of the great windows in the side intercolumniations have been much and justly admired. The latter feature is evidently an adaptation of the idea suggested by the great niches of the walls of the cella of the portico of the Pantheon at Rome, but by its adoption the architect has certainly avoided the common error of cutting up the walls by a repetition of pilasters much in the way, and the consequent introduction of narrow windows, of little advantage for the purposes of life.

It has sometimes been suggested as a subject of regret that the merchants' area was not covered in by a glass dome or covered ceiling; but it appears that before the new Exchange was designed, or an architect appointed, most of the leading merchants and brokers were consulted, and they almost unanimously decided on an open area, such as they had been accustomed to; and in consequence all the architects who prepared designs were compelled to adopt this arrangement.

This matter is now a good deal contested, a difference of opinion having arisen; on the whole, it appears to be a choice between an exposure to an occasionally inclement day, or the annoyances of a close and heated atmosphere. Practically there could not be any difficulty in covering the area, but there are some persons who doubt its advantages.

During the excavation for the foundations of this building many very interesting curiosities were found. About the site of the present north-west corner of the merchants' area a deep pit was met with, thirty feet below the present surface, full of the rubbish and remains of Roman London. This was thoroughly cleared out, and its contents, consisting of more than fifty coins of the lower empire, bushels of the pseudo-Samian ware, sandals, horse furniture, tablets, styles in bronze and iron, and an endless variety of curious articles, were collected with much care by the architect, and finally deposited in the museum of the City Library at Guildhall. An elaborate classed catalogue of all these remains was drawn up by Mr. Thomson, of the London Institution, and with a very learned and curious introduction by Mr. Tite, was printed in 1846 for the use of the Corporation of London. This catalogue is unfortunately very scarce.

These curiosities can always be seen at Guildhall, on an application to the Librarian, Mr. Herbert.

Reference to Plans.

With the exception of the Staircases indicated, the divisions on the ground floor represent shops. These shops communicate with the Mezzanine floor by small circular staircases.

FIRST FLOOR.

The rooms indicated by the letter A, are those reserved to the establishment of Lloyd's Assurance. Letter B, Royal Exchange Assurance. Letter C, London Assurance Companies.

EXCHANGES, COFFEE HOUSES, AND SALES.

The Royal Exchange, in Cornhill, has no longer the prominence as a place for the meeting of merchants it once had. By the various establishments which have branched from it, and alterations in the mode of doing business, the presence of the commercial man on 'Change is not so imperative. The Stock Exchange, Lloyd's, and the Corn Exchange, share the supremacy. The chief business is now the negotiation of foreign bills of exchange on Tuesdays and Fridays. The Royal Exchange is still, as when founded by Gresham, an open area with arcades around it, in which the merchants meet. Each has his standing where he is to be found, or where he makes his appointments, and the Rothschilds take their place near a pillar as their father did. Many of the sea-captains, and the brokers still go on 'Change, but the old arrangement of the walks has fallen into decay. The Scotch walk is no longer wanted; since Scotland has been brought so near by railway, the stockbrokers have migrated. The Salters, the Clothiers, and the Grocers go to the warehouses. The chief time of business is after 3 o'clock. (See the previous article.)

The Corn Exchange, in Mark Lane, is now the greatest corn market in the world. The market was formerly held on Cornhill, and afterwards at Bear Quay. The first Corn Exchange was built in 1747. The agents for sales are the corn-factors, each of whom has a stand or desk, in which are samples of corn. There is no qualification for a corn-factor. Besides the corn-factors, there are farmers, millers, bakers, merchants, and many speculators. The latter make this an arena for gambling as they do the markets for produce and stocks. The market days are Monday, Wednesday, and Friday; but Monday is the great day, the hours from 10 till 3. When there were variable and fixed duties on corn, the dealers carried on various operations for running up the prices, as the "average" price of the market either regulated the duty, or determined, if above a certain rate, that corn should come in free. Foreign corn used to be entered at the low duty, and retailed out from time to time, so that neither the farmer nor the government benefited. The importations of grain and flour from all parts of the world can now take place freely; and as the port of London is open throughout the year, while the ports, rivers, and canals of northern Europe and America and of the Black Sea are closed by ice, the corn trade of London is growing. There is no public granary in the metropolis, nor has the need of one been found. Formerly the city companies were obliged to keep corn in store at the Bridge-house; but as the king and government borrowed it, and did not return it, they were not sorry to give up the practice. Much foreign corn is kept in the private granaries, some of which will contain from 6000 to 7000 quarters, and the farmers hold corn in stacks safely in the open country, so that there is no inducement to establish the large granaries of the Continent, Till lately there used to be speculations on the variations of price in local markets, but the electric telegraph now makes the morning prices known over the country before nightfall. The *Mark Lane Express*, appearing on Monday evening, is the chief organ for the publication of the accounts of the crops and markets at home and abroad. Seeds are sold in the market, and in the neighbourhood are many agents for the supply of millwork and agricultural implements.

The Coal Exchange, in Thames Street, is one of the peculiar institutions of London. Hitherto coal has been brought by sea, chiefly from the Northumbrian shores, the railways not having yet organised the means of transit. The consumption approaches three millions of tons yearly, and gives rise to vast transactions. In olden times the city companies were obliged to keep up a stock of coals as of corn. The colliers lie in the Pool, or river below bridge, and are under there gulations of the corporation, who levy a duty applied to paying for London Bridge, and the Royal Exchange, and who have charge of the "metage," or measuring of the coals. The masters of colliers report themselves at Gravesend, and have to proceed in turn into the Pool, as the moorings will only accommodate a given number of ships. Notwithstanding all the care of the corporation to prevent it, attempts are made to keep back from market, and otherwise interfere with the price of coals, which has often been kept up by the coalowners at an extravagant rate. From the colliers the coals are unloaded by labourers called "coalwhippers" into barges, and thence carried to the wharfs on the river and canals. A proposition for a collier dock has not been carried out.

The Stock Exchange has entrances from Bartholomew Lane, Threadneedle Street, and Throgmorton Street, by Capel Court, Shorter's Court, New Court, and Hercules Passage, in which many of the brokers have offices. The business of dealing in securities was separated from banking towards the end of the seventeenth century, and the market was held in the Royal Exchange, in Sweetings Alley, (hence "jobbing in the Alley,") at Jonathan's Coffee House, and in the Rotunda of the Bank. In 1801 a separate building was erected by subscription on the spot already named. The transactions are chiefly carried on in three branches called houses, the English (for stocks and exchequer bills), the foreign (for stocks) and the railway, or share market. The business consists of two kinds, genuine and speculative, and is for money or for time. The members are of two classes, brokers and jobbers. The members of the Stock Exchange are subjected to a more severe system of internal discipline and police than any carried out elsewhere by the government, though they act in defiance of the government and the city. A candidate, admitted by ballot, has to undergo a period of probation, and not merely must he be recommended by members who attest they have known him for two years, and know nothing against him; but they must give security for him during a certain time. No member failing can be readmitted until his creditors have received a stipulated composition, nor can he be readmitted if his transactions are of a flagitious character. The committee chosen by the members has great power in questions of discipline. As no member is allowed to be a partner in other trading pursuits, losses to the members of the Stock Exchange from each other are neither many nor heavy. Their losses are from without. A fund for decayed members is liberally supported, and they are munificent contributors to public charities. The brokers are not expected to carry on transactions on their own account, and they act for the public. There are very few of them licensed brokers, and, contrary to the law of brokers, they do not declare their principals. They therefore became liable for the speculations and defalcations of principals on the Stock Exchange. The jobbers are capitalists, who buy and sell. A jobber in consols keeps on hand a stock of consols, and is always ready to buy and sell for the turn of the market, which is a commission or difference allowed to him. Parties finding their sales are charged lower than the top price often think they have been cheated, whereas the top price is the jobbers' selling price. This turn on consols is only an eighth per cent., but on shares in little demand, or of doubtful value, it is very much higher. The quotation of consols 96½ and ⅜, expresses the buying and selling price of the jobber. The jobber buys and sells in any required quantity, thereby saving time and trouble to the broker and customer. Besides transactions for money, under the plea of time being required for the transfer and delivery of stock and shares, certain times are named called "account days" for settling the transactions. For shares these days are twice a month. The gamblers take advantage of this arrangement to speculate for the "account," making bargains and sales without delivery of stock or payment of cash, until the account day, when the "differences" are settled in money, or continued till the next account. Those attempting to run up prices are called "bulls," and those running them down "bears." Money is lent by capitalists to members of the Stock Exchange on securities until the "account day," when the loan is stopped or continued, the securities altered and the interest readjusted. The foreign market is chiefly engaged in speculative transactions in the dubious, Spanish, and other stocks, but London is the pay place for Portuguese, Brazilian, Chilian, Mexican, Danish, Greek, and other stocks, which are largely held. The share market used to be devoted to mining, but is now chiefly engaged in railways, although mining transactions are now provided for by a market set up in 1850. In 1845 railway shares gave rise to a large business in the Hall of Commerce and the Auction Mart, principally carried on by "outsiders," or persons of bad character, named "stags." Numbers of young men become members of the Stock Exchange, without any legitimate object, and by continued speculation dissipate their fortunes in a few years, as the brokers' and jobbers' commission must in the long run eat up the whole. The names of defaulters on the settling days are chalked on a black board, and this is the ceremony of exclusion. Differences between members are arbitrated by the committee, and litigation is thus avoided. The Committee likewise assist in winding up the estates of defaulters. In New Court, fire-proof safes are provided for the custody of securities. No strangers are permitted to enter the Stock Exchange, and those who attempt it seldom get out without injury. Lists are daily published of the prices of stocks and shares, and, twice a week, of bullion and the foreign exchanges.

Lloyd's Rooms over the Royal Exchange have been partly described under the head of Bankers and Assurance. This is the great centre for all relating to shipping. One room is devoted to underwriters, that is, to those who assure shipping, and another to merchants. Many of the subscribers are merchants and shipbrokers, others go merely to read the papers. The captains' room is for the use of masters of merchantmen; here is kept Lloyd's Register of shipping, and the books containing the daily accounts of the movements and casualties of shipping. The committee give rewards to English and foreigners, who render services to ships in distress; and in the war time, they raised a Patriotic Fund for the reward and relief of the officers and men, who distinguished themselves on behalf of the mercantile and national interests.

The Jamaica Coffee House, in St. Michael's Alley is frequented by subscribers, many of whom are masters of West India merchantmen, and others are dealers in mining shares.

The North and South American Coffee House, and the Baltic Coffee House in Threadneedle Street are still frequented by those connected with the districts after which they are named, and have good collections of journals. The Jerusalem and East India Coffee House, in Cowper's Court, is an establishment of the like character, and has good collections of East Indian and Australian journals. The writers of the city articles frequent these houses.

These coffee houses have a room for subscribers, where they can read the papers or transact their business undisturbed; but the number of frequenters is much diminished. Formerly there were coffee houses for the Levant, New York, Virginia, Carolina, &c., but they have all fallen off. At these coffee houses the local papers were taken in, and bags were kept for ship letters.

Garraway's Coffee House, Change Alley, is virtually an auction mart, and here very large sales of landed property take place; likewise sales of reversionary interests, life annuities, and securities not in the market.

The Auction Mart, Bartholomew Lane, has sale rooms for the disposal of property, which are let out to auctioneers, and here much landed property is disposed of. There are frequently on show pictures, antiquities, Dutch bulbs, and other miscellaneous objects. The coffee room is much frequented by hangers on of the Stock Exchange.

The Hall of Commerce in Threadneedle Street is a subscription reading room, with accommodation for the transaction of business for those who have not offices. Sales of wool and of shares have been held here.

The sales of produce in London are on a large scale, and require great accommodation. The chief scene of them is at the Commercial Sale Rooms, between Mincing Lane and Mark Lane. There is the rendezvous of the grocers and druggists, and the great sales of tea (50,000,000 lbs. yearly), sugar (5,000,000 cwts.), tobacco (20,000,000 lbs.), coffee (30,000,000 lbs.), cocoa, pimento, pepper, cloves, and other spices, currants, indigo (50,000 cwts.), cochineal, dyes, drugs, bristles, feathers, wool, &c. These sales are commonly made by auction, but by a broker ; see Kelly's Directory, which elaborates well on this subject.

Pictures are sold by Christie and Manson; books by Sotheby, Hodgson, Southgate, Lewis, and other private auctioneers. Sales take place of forfeited goods at the Custom House, of unredeemed pawnbrokers' pledges, and of condemned Government stores.

Towards the river are the warehouses of the great stationers. The hop sales are in High Street, Borough, hides and horns at Leadenhall, leather at Bermondsey, hatting in the Borough. Other interests are accumulated together, the wholesale grocers near Mincing Lane, the druggists to the west of them, the provision trades in Lower Thames Street, oranges and foreign fruits in Botolph Lane, the iron and copper merchants in Upper Thames Street, potato wharfs on the Southwark shore, watch making, silver working, and their dependencies in Clerkenwell, the silk weaving in Spitalfields and Bethnal Green, the old clothes trade in Houndsditch, (where there is a Clothes Exchange and Rag Fair), zinc working in the New Road, shipbuilding and its dependent trades on the Lower Thames, the stone wharfs, marble works, cement works and potteries on the Upper Thames. Around the western neighbourhood of Cheapside and Watling Street are the warehouses for Manchester goods, millinery, artificial flowers, and umbrellas; in Basinghall Street for wool, in Newgate Street for Berlin wool. The sugar bakers are in the east end; the chemical works at Bow and in the eastern outskirts. Newspapers are sold in Catharine Street, where there is a News Exchange for exchanging copies of papers, and in the adjoining streets. Long Acre is the centre of the coachmaking trade. The wine and cork trade is around Mark Lane and Crutched Friars. The artists cluster round Newman Street. The lawyers and law stationers are drawn around the inns of court, reaching from the Thames to Great James Street and Bedford Row. Organ building is carried on near the New Road. The gold and silver refiners are scattered from Goldsmiths' Hall to Hatton Garden. The salt trade is carried on at the City Road basin. (See also "Arts and Manufactures.")

All these businesses have in their respective neighbourhoods the wholesale warehouses, the sale rooms, and the accessory trades. Nations are likewise drawn together, as the Irish in St. Giles's and elsewhere in colonies, the French near Leicester Square, the Germans in Holborn and East London, the Italians near Gray's Inn Lane, the Greek merchants in Finsbury Circus, the Spanish and Portuguese wine merchants near Mark Lane, the Jews near Houndsditch. Some nations carry on particular trades, as the Cornish in the metal trades, the Welsh are milkmen, Scotch, bakers and gardeners, the Irish bricklayers' labourers, and dock labourers, the French milliners, dyers, shoemakers, egg merchants and basket workers, the Germans bakers, sugar bakers, and Dutch clock makers and toy dealers, the Jews dealers in old clothes and furs, the Hindoos crossing sweepers, the Italians looking glass and barometer makers, plaster cast makers and street musicians, the Swiss hotel keepers. (See "Arts and Manufactures.")

EAST INDIA COMPANY,

Established and chartered in 1700, is governed by a chairman and 23 directors; the members, with the chairman, being 24. For the architecture of the building, see article "Public Buildings;" and for a description of the museum and library, see article "Learned Societies and Public Libraries;" and for an account of the several important offices for the management of the home affairs in the government of upwards of one hundred millions of subjects of the British Empire in the peninsula of India, see "East India Directory for 1851."

GALLERIES OF PICTURES.

THE COLLECTION OF THE RIGHT HONOURABLE LORD ASHBURTON, BATH HOUSE, PICCADILLY.

This superb collection was formed entirely by the first Lord Ashburton, father of the present Lord, and formerly known as Alexander Baring, Esq. Besides some Spanish and Italian pictures, principally obtained from the Count de Survilliers (Joseph Bonaparte) and General Sebastiani, it comprises nearly the whole of the very rare chefs-d'œuvre of the Dutch school which formed the magnificent cabinet of Monsieur de Talleyrand. The pictures decorate the principal apartments of the mansion, and can therefore only be viewed at convenient times by express permission. The house is a modern erection of very unpretending exterior, and is called Bath House, from a former mansion belonging to Sir William Pulteney, of Bath, which formerly stood here. A broad single flight of stairs reaches the hall in the centre of the building, which is lighted by a dome. On the landing of the staircase is a picture of Poultry by Hendekoeter. In the hall, besides some antique busts, are the marble statues of Hebe and of Mercury slaying Argus, by Thorwaldsen, and a group of Cupid and Psyche, by Finelli of Rome. The first apartment is:—

THE LIBRARY.

Murillo. Head of Christ.

Albert Durer. A Gentleman in Armour.

Adrian Ostade. Interior, from the Choiseul Gallery.

Rembrandt. Portrait of Jansen, from M. Talleyrand.

Philip Wouvermans. "*La ferme au Colombier.*" One of the painter's most famous works, called usually the Praslin Picture, having been in that rich collection, and subsequently in Prince Talleyrand's.

Rembrandt. Portrait of Lieven van Coppenholl, from Lucien Bonaparte's collection.

Jan Steen. Playing at Nine Pins, from the Talleyrand cabinet, after adorning several of the most celebrated in Europe.

Velasquez. A Stag Hunt in the Park of Aranjuez, brought by Joseph Bonaparte from the Palace of Madrid.

J. Ruysdael. A Woody Scene, from the collection of Watson Taylor, Esq.

Adrian Ostade. An Interior, from the Braancamp cabinet.

F. Mieris. A Group of a Lady and Gentleman, from the Geldermeester collection.

A. Ostade. Three Peasants Carousing, from the Braancamp collection.

J. Ruysdael. Landscape after Rain, from the collection of Watson Taylor, Esq.

Annibal Caracci. The Entombment of Christ, from Lucien Bonaparte's collection.

Domenichino. Moses and the Burning Bush, from the Colonna Palace.

Rembrandt. Portrait of himself, from Lord Radstock's collection.

Wynants. Landscape, figures by A. Vandevelde.

A. Vanderwerff. St. Margaret, from Prince Talleyrand's cabinet.

G. Metzu. The Female Artist, last in the collection of Prince Galitzin.

Caravaggio. A Saint.

Velasquez. Philip IV. of Spain.

J. van Huysum. Flowers in a Vase, from the Hesse Cassel Gallery, whence it was carried off by the French.

Rembrandt. Portrait of a Gentleman, from the Hesse Cassel and Malmaison collections.

P. P. Rubens. Rape of the Sabines, from the Danoot collection. Sir Joshua Reynolds, speaking of this and the companion, says that "few pictures of Rubens, even of his most finished works, give a higher idea of his genius."

Murillo. The Charity of St. Thomas, brought from the Franciscan monastery of Seville by General Sebastiani.

Rembrandt. Portrait of a Lady, from the Hesse Cassel and Malmaison collections.

P. P. Rubens. The Reconciliation of the Romans and Sabines, from the Danoot collection, companion of the picture abovenamed.

Holbein. Portrait of a Prince of Saxony.

J. van Huysum. Fruit, from the Hesse Cassel Gallery.

N. Poussin. Jupiter and Io, from Lucien Bonaparte's collection.

D. Teniers. Landscape, with a Shepherd and Cattle; from Prince Talleyrand's collection.

N. Maas. A Woman Sewing.

N. Berghens. Landscape, with Ruins; from the Djonval collection.

Sir Joshua Reynolds. Head of Ariadne.

P. Potter. A Dairy Farm; from the collections of Count Fries of Vienna, and of Baron Puthon.

Isaac Ostade. A Country Inn, with numerous figures; from the collection of Prince Talleyrand.

C. Du Jardin. Landscape, with Watermill; from the cabinet of M. Eynard, of Paris.

L. Backhuyzen. View on the Sea Coast; from the cabinet of Prince Talleyrand.

Jan Steen. An Interior, with figures; from the Prince d'Aremberg's collection.

D. Teniers. The Seven Works of Mercy; originally painted for the Duc d'Alva, afterwards in the Royal Gallery of Madrid, and lastly in the collection of Prince Talleyrand.

G. Dow. The Double Surprise; formerly in the Poulain and other celebrated collections.

P. Wouvermans. Landscape and Figures; from the Le Brun collection.

Annibal Caracci. The infant Jesus Sleeping, attended by Angels; from the Borghese Palace.

M. Hobbima. A Woody Landscape, with Figures.

A. Ostade. Interior, with Figures; from the Duc d'Alberg's cabinet.

A. Vandevelde. Woody Landscape, with Cattle; from Mons. Trouard's collection.

J. Ruysdael. Village Scene; from General Verdier's collection.

L. Backhuyzen. A Sea View.

Karel de Moor. A Lady and Two Children at a Window.

DRAWING-ROOM.

Greuze. A youthful Female Head.

Raffaelle. The Virgin and Child.

G. Metzu. A Woman Reading at a Window; from the collection of Madame Hoffman.

Canaletti. An Italian Landscape, with Ruins.

Murillo. The Virgin standing on a Globe; from the collection of General Sebastiani.

G. Dow. The Hermit in Devotion; an extraordinary work, from the collection of Randon de Boisset.

P. De Hooge. In a Street at Utrecht; from the collection of Mons. Helsleuter, of Amsterdam.

G. Dow. A Girl gathering a Pink at a Window; from the Duc de Berri's collection.

C. Du Jardin. "*Le Petit Dessinateur*;" from the Choiseul, Le Brun, and Prince Talleyrand's collection.

A. Ostade. A Woman holding a Child; from the Duc de Praslin and Prince Talleyrand's collection.

J. Ruysdael. Landscape; from the collection of Watson Taylor, Esq.

A. Ostade. A Dutch Village, with Figures; from the Duc de Praslin's collection.

P. Wouvermans. The Flemish Washerwoman; from the Duc de Praslin and Prince Talleyrand's collections.

Guido. Head of Christ crowned with Thorns.

A. Cuyp. Landscape and Figures; formerly in the Gallery of the King of Poland, and lastly in that of Prince Talleyrand.

G. Terburg. Interior, with Three Figures; from Prince Talleyrand's collection.

Murillo. Virgin and Child in the Clouds with Angels; formerly in the possession of the Prince of Peace, and afterwards in that of General Sebastiani.

A. Vandevelde. The Hay Harvest; from the collection of Prince Talleyrand.

Paul Potter. Oxen in a Meadow.

N. Berghem. The Lobster Catchers; from the collections of Count Pourtales and Prince Talleyrand.

J. Ruysdael. Landscape; from Watson Taylor, Esq.'s collection.

A. Vandyck. Whole length of Charles I.; from the Empress Josephine's collection at Malmaison.

Titian. Venus admiring herself in a Looking-Glass.

A. Vandyck. Queen Henrietta Maria; from the Empress Josephine's collection at Malmaison.

P. Veronese. Our Saviour fainting on the Mount.

A. Cuyp. Cattle in a Meadow; from the La Perrier cabinet.

Giorgione. The Request; from the Borghese Palace.

D. Teniers. "Le Manchot;" one of the most perfect works of the master; from Prince Talleyrand's collection.

D. Teniers. A Village Fête; from Watson Taylor, Esq.'s collection.

A. Vandyck. The Holy Family with Angels; one of the most capital works of this great painter, and the principal ornament of Prince Talleyrand's cabinet.

W. Vandevelde. "La petite Flotte;" formerly in the Gallery of the King of Sardinia, and finally in that of Prince Talleyrand.

N. Berghem. "Le Fagot;" a landscape and figures under this title, of the highest quality of the master, from the collection of Prince Talleyrand.

Titian. Herodias, with the Head of St. John on a Salver; from Lord Radstock's collection.

Vander Heyden. Interior of a Dutch Town; from the Hesse Cassel Gallery, and placed by the French in the Gallery of the Louvre, from which it was abstracted at the period of the Restoration of the Bourbons to the throne.

Leonardo da Vinci. The Infant Jesus in the Arms of the Virgin; one of the great ornaments of the Royal Palace of the Escurial, from whence it was taken by a French officer during the war.

P. Wouvermans. Landscape and many Figures; from the collection of Madame Hoffman at Haerlem.

Canaletti. Landscape, with Italian Edifices.

Leonardo da Vinci. Infant Christ, with St. John and the Lamb; removed from the Royal Palace of Madrid by Joseph Bonaparte.

Vandyck. One of the Children of Charles I.

Guercino. St. Sebastian, attended by Angels.

D. Teniers. His own Portrait, from Prince Talleyrand's collection.

G. Netscher. "Le petit Physicien," a celebrated gem of art; from Watson Taylor, Esq.'s collection.

THE WEST DRAWING-ROOM.

J. & A. Both. Mountainous Landscape, with Figures.

A. Cuyp. Huntsmen halting near Herdsmen; from the cabinet of Van Slingelandt.

Corregio. St. Peter, St. Margaret, St. Mary Magdalen, and St. Anthony of Padua; formerly in the Mareschalchi Palace at Bologna.

Giorgione. Portrait of a Gentleman in a Ruff.

Vandyck. The Virgin and Child; from the collection of Joseph Bonaparte, ex-King of Spain.

Titian. The famous Magdalen; painted expressly for Philip II. of Spain, where it remained in the royal collection until taken away by Joseph Bonaparte.

Luini. The Virgin and Child.

A. Vandyck. Portrait of Prince William of Nassau.

Rembrandt. A Gentleman sitting in an Arm-Chair; from Madame Hoffman's collection at Haerlem.

THE DINING-ROOM.

P. P. Rubens. The Wolf Hunt. This grand and renowned picture, after adorning the gallery of the Louvre, was restored to the Altamira family of Madrid, from whence it came to England.

A. Cuyp. Portrait of Himself.

Rembrandt. Portrait of a Gentleman.

P. P. Rubens. The Chase of Diana.

BARBER'S HALL, CITY.

In the small dining-room of this city company, an important picture, by Hans Holbein, is hung at the end, over the sideboard. The subject is King Henry VIII., and contains nineteen whole-length figures of life size. The King is seen seated in the centre, and is presenting a charter to the kneeling members of the company, fifteen of whom are placed on one side and three on the other. Dr. Waagen says, "All the heads are of extraordinary unaffected truth to nature, and seem to be painted in the reddish brown tone which Holbein used in his early period. Everything, even to the mat, is executed with his usual care."

THE BRIDEWELL HOSPITAL, BRIDGE STREET, BLACKFRIARS.

There is a picture in this establishment of large dimensions, nearly ten feet square, painted by Hans Holbein. King Edward VI. is represented seated on a throne, giving the charter for the foundation of the hospital to the Lord Mayor, accompanied by the sheriffs, who are on the left-hand side. On the right hand is placed the Lord Chancellor, the Bishop of London, and four other persons, one of which is believed to be a likeness of Hans Holbein himself. The figures are all of life size, and the execution appears to be of Holbein's later and better period.

THE COLLECTION OF THOMAS BARING, ESQ., M.P., UPPER GROSVENOR STREET, GROSVENOR SQUARE.

This collection, which is of very recent formation, bids fair to rival in importance many of longer standing, and of great fame. It already numbers upwards of 300 pictures, distributed through the apartments, and filling a moderately-sized gallery, which has been erected expressly to display some of the larger works. The pictures are of all schools—the Dutch and Flemish portion consists, with others, of a considerable number of those formerly existing in the cabinet of the Baron Verstolk van Soelen, at the Hague; to which has subsequently been added many of the fine Italian pictures formerly belonging to Sir Thomas Baring. The English pictures include many painted by our first-rate artists, which have attracted admiration in the annual exhibitions. Among the latter are:—

Sir E. Landseer, R.A. The travelled Monkey.
R. P. Bonington. Flat Sea-shore at Low Water.
W. Mulready, R.A. The Whistonian Controversy.
E. W. Cooke. A Sea Piece, with Gale; also a View of Amsterdam, and the Interior of Rembrandt's Mill.
W. Collins, R.A. A Coast Scene, and Fishermen's Children.
Sir D. Wilkie. The original study for the picture of the Chelsea Pensioners reading the Gazette.
J. Creswick, A.R.A. Avenue in a Park.
Sir A. W. Callcott, R.A. Cologne, from the River.
Sir J. Reynolds. Study of Two Children's Heads.
F. Goodall. "Le bon Curé."
W. Mulready, R.A. Children giving Alms.
T. Uwins, R.A. Italian Peasants returning Home.
C. R. Leslie, R.A. The Merry Wives of Windsor.
Sir D. Wilkie, R.A. The Rabbit on the Wall, and a Doctor bleeding a Lady.
R. P. Bonington. The Ducal Palace, Venice; a large and superb picture, with many figures.
Sir D. Wilkie. The Turkish Letter Writer, and another picture of the Arab Story Teller in a Café.
W. Collins, R.A. The Errand Cart, and a Landscape, with figures of an old man, a child, and an ass.
Frank Stone. The Admonition and the Proposal.
W. Etty, R.A. Venus, Cupid, and Psyche; and the companion of Sabrina and Nymphs.
Sir Joshua Reynolds. Portraits of Miss Archer and Mrs. Fenhoulet; and a picture of Venus chiding Cupid.
T. Webster, R.A. Going to School, and Returning from School.
Gainsborough. Landscape and Cows.
R. Wilson. Landscape, a View in Scotland.

Besides others by Lauder, T. S. Cooper, J. Linnell, T. Stothard, Naysmith, Witherington, Howard, Liverseege, Lee, D. Roberts, Maclise, Simpson, Poole, Edmonstone, Muller, Fraser, Horsley, and several others, mostly selected from the exhibitions of the Royal Academy; the admired Holy Family, by Paul Delaroche, exhibited in 1845.

Among the painters of the modern Belgian and Dutch school are exquisite pictures by Koekkock, Schotel, Schelfhout, Dyckmans, E. Verboeckhoven, Van

Hone, Van Schendel, H. Leys, Luycx, Madou, and De Bruycker.

The pictures of the ancient Dutch and Flemish school are very numerous; a few of them deserve especial notice.

C. Du Jardin. The Manege, from Count de Morny's cabinet.

De Witt. Interior of a Church; from the Verstolk collection.

J. Wynants. Landscape, with Figures by Lingelbach.

Jan Steen. The Love-sick Lady; from the Verstolk collection.

Rembrandt. An old Man's Head; from the same.

A. Vandevelde. The "Rendezvous de Chasse;" formerly in the various collections of the Duc de Chabot, Prince Galitzin, and Baron Verstolk.

G. Metzu. The Intruder; from the last-named collection.

J. Asselyn. Cattle watering; from the same.

J. Vander Heyden. Entrance to a City, with figures by A. Vandevelde; idem.

G. Terburg. A Lady drinking; idem.

Jan Steen. A Portrait of himself. The drowsy Schoolmaster; idem.

G. Terburg. The Letter; idem.

P. Wouvermans. Travellers halting; idem.

G. Metzu. A Gentleman with a Pipe; from the Braancamp and Verstolk cabinets.

A. Ostade. Boors Carousing; from the latter collection.

A. Vandevelde. A Hunting Party; a picture of singular beauty, which has adorned many celebrated collections, and finally that of Baron Verstolk.

A. Cuyp. View on a River, a superlative work, even among this great painter's performances; from the Verstolk collection.

P. Wouvermans. "Les Marchands des Chevaux;" formerly in the Duc de Choiseul's gallery, and afterwards in that of the Prince de Conti, M. Brentano, and the Baron Verstolk.

Jan Steen. The Wedding; from the last-named collection.

C. Dusart. An Interior; from the same.

Ferdinand Bol. The Prize of Archery; from the same collection. This, and a picture containing portraits of a lady and gentleman, rank as the most capital works of this painter.

The preceding constitute but a few of the fine examples of this school of art. Among the Italian and Spanish pictures are, by—

Seb. Del Piombo. The Virgin, Child, St. John, St. Joseph, and the Donor, half-lengths of life size; a work of the highest quality of fine art.

G. Vasari. A pair of life-size figures of St. Mark and St. John.

Giulio Romano. The Virgin and Child, half-length.

G. Bellini. The same subject.

Giorgione. Salome, with the head of St. John.

Titian. A Portrait of a Gentleman.

Paul Veronese. The Baptism of Christ, and the Portrait of a Gentleman.

Schidone. The Repose in Egypt.

Annibal Caracci. Christ bearing his Cross, and a Landscape, with Nymphs and Satyrs.

Domenichino. Two Pictures of Landscapes.

Guido. The Ecce Homo, and St. Cecilia.

Guercino. A grand picture of the Virgin and Child, with attendant Angels playing on musical instruments.

Spagnoletto. A large Altar-Piece of a Holy Family with Saints.

Claude. Three excellent Landscapes.

Murillo. The Madonna on the Crescent.

Among the many repetitions by Murillo of this subject, this is the very finest of all those in England. There are four other specimens by this painter, and numerous other works of most of the famous masters, including Nicholas and Gaspar Poussin, Gerard Lairesse, G. Bassano, Parmegiano, L. Caracci, P. F. Mola, C. Dolce, G. Crespi, Salvator Rosa, Morales, &c. The grand picture of Diana departing for the Chase, formerly belonging to Sir Simon Clarke, is placed at the end of the gallery. There is also in the collection an authentic picture by J. van Eyck of St. Jerome in his Study, and a Virgin and Child with attendants, by Mabuse.

The pictures can only be seen by express permission, on introduction by any of Mr. Baring's friends.

THE SOCIETY OF BRITISH ARTISTS.

In the year 1823 a number of artists formed themselves into a society under the above designation, principally for the purpose of exhibiting their works more advantageously than by the limited means afforded at the Royal Academy. The society has three fine spacious rooms lighted from the roof, the entrance to which is in Suffolk Street, near Charing Cross. They open an exhibition of their own performances in the month of April, annually, the admission fee to which is one shilling. All artists are permitted to exhibit on their walls, without being members, and the number of works is commonly about 500 or 600. Two years ago Her Majesty conferred a charter on the society, and then a school of instruction was established, to which admission was given by payment of a small sum. Lectures are also occasionally given by the members and other learned professors. Many of its original members have seceded and been received into the Royal Academy, as will probably continue to be the case, owing to the high standing of this latter body in the public opinion, and, from the crowds that always fill its rooms, the better chance of effecting sales. In the exhibition of the Society of British Artists a clerk is always in attendance to inform visitors of the prices attached to the respective pictures.

THE BRITISH INSTITUTION.

In February, 1805, this institution was founded by the most eminent amateurs of painting among the nobility and gentry, for the express purpose of encouraging the Fine Arts in England, by promoting the sale of their works. For this laudable purpose the society obtained the lease of premises in Pall Mall, which had been erected by Messrs. Boydell, the publishers, for the pictures forming the Shakspeare Gallery, by which name the building is still commonly called. The premises comprise three handsome rooms, lighted from above, and in the month of February there is annually an exhibition of between 300 and 400 pictures painted by living artists, and a few works of sculpture. Portraits being specially excluded, the exhibition becomes very pleasing, and the sales of the pictures have, on an average, been successful. One shilling is charged for admission, and 5 per cent. is deducted from the amount of sales for the expenses of the institution. The other portion arises from the subscriptions of the members, amongst whom are persons of the highest rank in the country, the Duke of Sutherland being the president. The exhibition of modern pictures closes as soon as that of the Royal Academy opens. In the month of June following, the directors open an exhibition of ancient pictures gathered from the different great private galleries, some few of which are left during the autumnal months for the students in painting to make copies for improvement.

GALLERY OF PORTRAITS IN THE BRITISH MUSEUM.

King James I. On panel. Presented by Dr. A. Gifford.

King Henry VIII. On panel. Presented by Dr. A. Gifford, in 1758.

Oliver Cromwell. "A copy from Mr. Cromwell's original, grandson to Hen. Cromwell, Ld. Lt. of Ireland. 1725." This portrait came with the Cottonian Library.

Mary Queen of Scots, by Corn. Jansen.

King Edward III.; on panel. Presented by Dr. A. Gifford.

King George I.; from the old Cottonian Library.

Henrietta Maria, Queen of Charles I.

King Henry VI.; on panel. Presented by Dr. A. Gifford.

Oliver Cromwell, by Walker. Bequeathed, 1784, by Sir Robert Rich, Bart., to whose great-grandfather, Nathaniel Rich, Esq., then serving as a Colonel of Horse in the Parliamentary Army, it was presented by Cromwell himself. On panel.

King James I. Presented by Mr. Cook.

Mary Queen of Scots, "æt. 42." On panel. Presented by Lieut.-Gen. Thornton.

King William III. Presented by Dr. A. Gifford.

William Duke of Cumberland, by Morier. Presented by Lieut.-Gen. Thornton.

James Duke of Monmouth. Presented by Dr. A. Gifford.

King Richard II. Presented in 1766, by John Goodman, Esq., of the Middle Temple.

Queen Elizabeth, by Zucchero. Presented by the Earl of Macclesfield, 1760.

Mary Queen of Scots.

King George II., wh. l., by Shackleton. Painted for the Trustees.

Queen Elizabeth. "Anno Dñi 1567." On panel. Presented by Lord Cardross, 1765.

Margaret Countess of Richmond. Presented by Dr. A. Gifford.

King Charles II., by Sir P. Lely. Presented by Dr. A. Gifford.

King Henry V. On panel. Presented by Dr. A. Gifford.

King Edward VI. Presented, in 1768, by Mrs. Mary Mackmorran.

Caroline, Queen of George II., by Jarvis. Presented by Lieut.-Gen. Thornton.

Dr. Andrew Gifford, by Russel, 1774. Bequeathed by himself, 1784.

Rev. Dr. Thos. Birch, painted in 1735. Bequeathed by himself.

James, 1st Duke of Chandos, wh. l. Presented by James Farquharson, Esq.

Humphry Wanly, Librarian to the Earl of Oxford. Presented by Herbert Westfaling, Esq.

Claudius James Rich, Esq., born 1787, died at Shiraz, 1821. Resident of the English East India Company at Bagdad from 1808 to 1821, whose collection of MSS., Medals, and Antiquities is placed in the British Museum. Presented by his Widow.

Joseph Planta, Esq., F.R.S., Principal Librarian of the British Museum, from 1799 to 1827, by T. Philips, R.A., Presented by the Right Hon. Joseph Planta, G.C.H.

Sir Hans Sloane, as "President of the Royal Society." Half length. "Stephn. Slaughter pinx. 1736."

Sir Hans Sloane, wh. l., seated.

Dr. John Ward, of Gresham College. Presented by T. Hollis, Esq.

Dr. Matthew Maty, 2nd Principal Librarian of the British Museum, by Dupan. Bequeathed by himself, 1776.

Major-General Hardwicke, by W. Hawkins. Presented by J. E. Gray, Esq.

Sir Hans Sloane, by Murray.

Dr. Francis Turner, Bishop of Ely.

Robert Earl of Oxford, by Sir G. Kneller. Presented, in 1768, by the Duchess Dowager of Portland.

Sir Robert Cotton. Presented, in 1792, by Paul Methuen, Esq., of Corsham.

Sir John Cotton; from the Old Cottonian Library.

Rt. Hon. Arthur Onslow, Speaker of the H. of Commons, wh. l. Presented by Admiral Onslow.

Sir Thomas Cotton. Presented by his descendant, Mrs. H. M. Bowdler, 1826.

Sir Robert Cotton, A.D. 1629. From the Cottonian Library.

Edward Earl of Oxford, by Dahl. Presented, in 1768, by his daughter, the Duchess Dowager of Portland.

Humphrey Wanley. Presented by the Earl of Leicester, in 1795, afterwards Marq. of Townshend and E. of Leic. "Humfredus Wanley Coventriensis, 1717."

Rev. Dr. Thomas Birch.

Peter I., Emperor of Russia, "from an original, drawn by Klingstad, in the possession of the Earl of Hertford, 1725; then Ambassador at Petersburgh." From the Old Cottonian Library.

Pedigree of the Cornelia Family.

Stanislaus Augustus I., King of Poland; Charles XII. of Sweden. Presented by the Rev. A. Planta.

A Hunting Piece, by Gio. Battista Weenix.

Louis XIV. Presented by the Rev. A. Planta.

Lord Chancellor Bacon. Presented by Dr. A. Gifford.

An Unknown Head, in ruff and beard; on panel; "Ætatis suæ 59. 1608."

John Duke of Marlborough.

William Courten, Esq., when young, inscribed "Gul. Courten Arm."

Andrew Marvel. Presented by Robert Nettleton, Esq., Gov. of the Russia Company.

Admiral Lord Anson. A copy from the Picture at Wimpole. Presented, in 1814, by the Earl of Hardwicke.

Archbishop Usher. Presented by Dr. A. Gifford.

Dr. Thomas Burnet. "Ad vivum pinxit Romæ Ferdinand, 1675." Bequeathed by Matthew Waters, Esq., 1788.

Henry Stebbing, D.D. "Joseph Highmore, pinx. 1757." Presented by his grandson Henry Stebbing, Esq., 1813.

Sir Henry Spelman. Presented by Dr. A. Gifford.

An Unknown Head, a skull in the right hand; on panel; "Ætatis suæ 24. A° 1569."

Sir William Dugdale.

William Cecil, Lord Burghley. On panel. Presented by Dr. A. Gifford.

Matthew Prior, by Hudson, from an original of Richardson. Presented by the Earl of Besborough, 1775.

An Unknown Portrait. In one corner is written "J. Ray." Bequeathed by Sir William Watson: said to have been painted by Mrs. Beale.

William Camden. On panel. "Ætatis LVIII. MDCIX."

Sir Isaac Newton. Bequeathed by John Hatsell, Esq., Clerk of the H. of Commons. 1821.

Rev. John Ray. This Portrait belonged to Sir Hans Sloane.

John Speed, the historian. On panel.

Archbishop Cranmer, "Anno etatis 57, Julij 20," by Gerlach Flicke*. "Gerlacus fliccius Germanus faciebat." On panel. Presented, in 1766, by John Michell, Esq., M.P. of Bayfield Hall, Norfolk.

William Shakspeare. Presented by M. Maty, M.D.

George Buchanan. A small portrait on panel. "Ætatis 76. Año. 1581."

Voltaire. Presented by M. Maty, M.D. 1760.

An Unknown Head.

Vesalius, on panel, by Sir Antonio More. This Portrait belonged to Sir Hans Sloane.

An Unknown Portrait. Presented by Dr. A. Gifford.

A portrait (called Chas. I. when Prince). Presented, in 1759, by Mrs. Elizabeth Gambarini.

Anna Maria Schurman, by John Lievens.

Sir Francis Drake.

Pope Clement X.

Sir Antonio More. On panel. Presented by Dr. A. Gifford.

Cosmo de Medici and his Secretary Bartol. Concini. A copy from Titian. Brought from the Old Cottonian Library.

Martin Luther, a small wh. l. on panel. "D. Martinus Luter, 1546, 18 Febr. Ætatis 63 iaer."

Queen Mary I. of England. "Maria Princeps, Año Dom. 1531." "I. B." initials of the painter. Presented by Sir Thomas Mantel.

George, tenth and last Earl Marischal of Scotland. On copper; painted at Rome, 1752, by Placido Costanzi. Presented by Lord Glenbervie.

Jean Rousseau, employed in the Paintings of Montague House. Presented by Mrs. Wollfryes, 1757.

Capt. William Dampier, by Murray. It belonged to Sir Hans Sloane.

Cardinal Svorza Palavicini, 1663. Presented by Smart Lethieullier, Esq.

Ulysses Aldrovandus, by Giorgioni. It belonged to Sir Hans Sloane.

An unknown Portrait of a Gentleman in a ruff and long beard: "Ætatis suæ 66, An. Dom. 1590." On panel.

Isabella, Infanta of Spain.

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* Gerlach or Gerbertus Fliccius. See Walp. Anecd. of Paint., 4to. edit., p. 4.

St. Evremond. Presented by M. Maty, M.D.

Sir Peter Paul Rubens.

Landscape by Wilson.

John Gutenberg, the inventor of the art of printing with moveable types. Presented by Paul Vaillant, Esq.

Henry Frederick, Prince of Orange. Presented, in 1782, by Lord Fred. Campbell.

John Locke. Presented by Matthew Maty, M.D.

Governor Herbert, by Devis. Presented by Admiral Page.

James Parsons, M.D. "Ætat. 60 anno quo Benj. Wilson pinxit, 1762." Bequeathed by Dr. Knight, 1772.

John Wallis, D.D., the Mathematician.

Mary Davis, an inhabitant of Great Saughall in Cheshire, taken 1668, "ætatis 74." At the age of 28 an excrescence grew upon her head, like a wen, which continued 30 years, and then grew into two horns, one of which the profile represents.

Sir John Doderidge. Presented by Dr. A. Gifford.

Dr. Gowin Knight, 1st principal Librarian of the British Museum, by Benj^{n}. Wilson. Bequeathed by Dr. Knight, 1772.

Frank of Borsalia, Earl of Ostervant, who died in 1470.

Algernon Sidney.

Alexander Pope. Presented by Francis Annesley, Esq.

Unknown, t. Cha. II.

Philip Dormer, Earl of Chesterfield, by Ramsay, 1765. Presented by Sir Thomas Robinson, Bart., in 1777.

Richard Baxter. Presented by Dr. A. Gifford, 1760.

Sir Henry Vane, Jun. Presented by Thomas Hollis, Esq.

Lodowick Muggleton, "Aged 66, 1674."

Thomas Britton, the musical small-coalman, "Ætat. 61, 1703." By Woolaston.

Mr. George Vertue, the Engraver, "Æt. L. 1733." Presented by his Widow, 1775.

Robert Cecil, 1st Earl of Salisbury. On panel. Presented by Dr. A. Gifford.

At the north end of this gallery, by the sides of the door, are two paintings, one of the Cromlech at Plas Newydd, Anglesea; the other of Stonehenge. Presented by Richard Tongue, Esq., 1837.

The following portraits also are to be found in the Print Room: Geoffrey Chaucer, 1400, a small wh. l. on panel; a Limning of Frederick III. of Saxony, by Lucas Cranach; the Portraits of Moliere, Corneille, and an unknown head by Dobson, all on panel; and the Portrait of a Pope or Cardinal.

PICTURES IN THE RESIDENCE OF THE DUKE OF BUCCLEUCH, MONTAGU HOUSE, WHITEHALL.

Several fine pictures by Vandyck:—Very fine full-length portrait, front face, buff boots, &c., of the Duke of Hamilton in armour; full-length portrait of Lord Holland, slashed sleeves, hair short on forehead; full-length portrait of the Duke of Richmond in complete black, yellow hair over shoulders, brownish background. Thirty-five sketches by Vandyck, made for the much-esteemed series of portraits etched by Vandyck and others, and published by Martin Van Enden; formerly belonging to Sir Peter Lely; purchased at the sale of his effects by Ralph Duke of Montagu. Canaletti's finest picture of a View of Whitehall, showing Holbein's gateway, Inigo Jones's banqueting house, and the steeple of St. Martin's, with the scaffolding about it. A remarkable series of English miniatures from the time of Isaac Oliver to the time of Zanetti.

CHELSEA HOSPITAL.

The chapel has a semicircular end where the communion table stands. In the domed ceiling above, the resurrection of our Saviour, painted by Sebastian Ricci, fills the entire concavity. The composition includes a great number of figures of soldiers and saints in the lower part, the upper being crowded with angels and cherubims. The execution of the whole is very masterly. Beneath the windows, on the sides, are suspended a variety of flags, taken in various battles, including thirteen eagles of the Imperial French Army, and some Indian colours of Tippoo Saib, with the brooms on the spear to indicate that he would sweep the Europeans from the territory of India.

The dining-hall on the opposite side has the end completely filled by a large picture, painted by Verris, representing Charles II. on horseback, with a variety of allegorical figures, one of which is pointed out as a personation of Nell Gwynne. The walls here are also adorned with a number of flags, trophies of the success of the British army. Among them are three from the land of the stripes and stars, the singular standards taken in the war with China, and also from the Sikhs. At the end of the hall are some English colours, bearing, in their ragged condition, proofs of deadly conflict, and some flagstaffs taken at Blenheim by the great Marlborough.

A large picture of the battle of Waterloo, painted by G. Jones, R.A., is hung in the secretary's office.

THE DUKE OF DEVONSHIRE, DEVONSHIRE HOUSE, PICCADILLY.

In a very splendid and capacious suite of reception rooms, which have recently received renovation by the decorator's art, there are many pictures of consequence hung upon the walls. Among them, by—

Sir J. Reynolds. Lord Richard Cavendish. The late Duchess of Devonshire, very fine.

N. Berghem. Evening Landscape, and Cattle. A Sea Port, with elegant figures on horseback.

William Vandevelde. An admirable Sea-shore, calm.

Rembrandt. A Jew Rabbi seated.

Frank Hals. Portrait of a Man.

Lucas van Leyden. The Dentist, engraved by himself.

Lucas van Uden. A Woody Landscape.

Vandyck. The Countess of Carlisle, in an arm-chair. Portraits of Himself and of Rubens, a pair of oval pictures, in grisaille, made for the engraving by Pontius; also two Portraits of Persons unknown.

Moses in the Bulrushes.

Jacob Jordaens. A pair of whole-lengths of Prince Frederick Henry of Orange, and the Princess.

By other masters of the Flemish school are examples by Rottenhammer, Brauwer, Poelemberg, Steenwyck, D. Mytens, Orizonte, J. B. Weenix, Van Goyen, Momper, R. Savary, and Vander Meulen.

In the Italian school the most important are—

Luca Penni. Neptune and Amphitrite embracing.

Antonella da Messina. Head of the Saviour.

Carlo Dolce. A similar Head, unusually fine.

Pietro da Cortona. A Mountainous Landscape.

Sasso Ferrato. The Head of the Madonna.

Salvator Rosa. Jacob's Dream in a Landscape.

Warriors reposing, and five other specimens.

Giorgione. Head of a Nobleman.

Titian. Whole-length Portrait of Philip II. King of Spain. Portrait of a Young Gentleman. A Grand Classical Landscape, with figures of St. John preaching to the multitude.

Albano. Harvest Scene, with mythological figures.

M. Preti. An Old Man playing the Lute.
M. A. da Caravaggio. A Musical Party.
Guercino. Susanna and the Elders.
Guido. Perseus and Andromeda, life-size figures.
Baroccio. The Holy Family.
Ludovico Caracci. The Crucifixion.
Domenichino. Susanna and the Elders. A Female Figure soaring on clouds.
Parmegiano. St. Mary Magdalen in the Desert. The Virgin Fainting at the Tomb of Christ.
G. Bassano. Moses before the Burning Bush. Apparition of the Virgin to a Shepherd.
Boltraffio. Portrait of a Young Lady.
S. del Piombo. Christ and the Woman of Samaria.
A. Schiavone. St. Jerome in the Desert.
Alessandro Veronese. Cupid watching Psyche.
Tintoretto. Portrait of a Gentleman seated. Portrait of Nicholas Capello. Portrait of a Gentleman.
Paul Veronese. The Wise Men's Offering.

There are also some good pictures by the lesser Italian painters, as Biscaino, Luca Giordano, C. Maratti, F. Mola, P. Lauri, Carlo Cignani, Romamelli, S. Ricci, and others.

The French and German schools comprise excellent works, as—

N. Poussin. The Classical Landscape, with the Three Shepherds, and the Tomb inscribed "Et in arcadia ego." The Holy Family with Angels. A Pair of Roman Landscapes. Angels worshipping Jehovah.
Lesueur. The Queen of Sheba before Solomon.
Bourguignon. Five Pictures of Cattle Subjects.
Gaspar Poussin. Mountainous Scenery near the Sea. Four small circular Landscapes.

There are besides a few pictures by Laucret, Watteau, some portraits by Holbein, and of his period, and a clever picture by A. Elsheimer of the Flight into Egypt.

At his Grace's villa, near Chiswick, about five miles from London, there are also many very excellent pictures of the Italian and Dutch schools dispersed through the various rooms, and a very interesting small altar-piece, attributed to John Van Eyck, representing, according to Horace Walpole, the family of Lord Clifford.

MR. G. TOMLINE, M.P., CARLTON HOUSE TERRACE,

Is the possessor of a few pictures of high importance. Among them is the Pool of Bethesda, or Christ healing the Paralytic, considered to be the finest picture from the hand of Murillo, for elevation of character and other great qualities of art. It was obtained from the Hospital of La Caridad, at Seville, by Marshal Soult, of whom Mr. Tomline purchased it at a cost of 7500*l.*, being the largest sum ever given for any picture in England. The picture of Christ and the Woman of Samaria by Annibal Caracci, one of three famous Giustiniani Caraccis, is also here, as well as the identical portrait of Charles V., painted from life by Titian, who went to Bologna for the purpose. It came from the Zambeccari Palace in that city.

DULWICH COLLEGE.

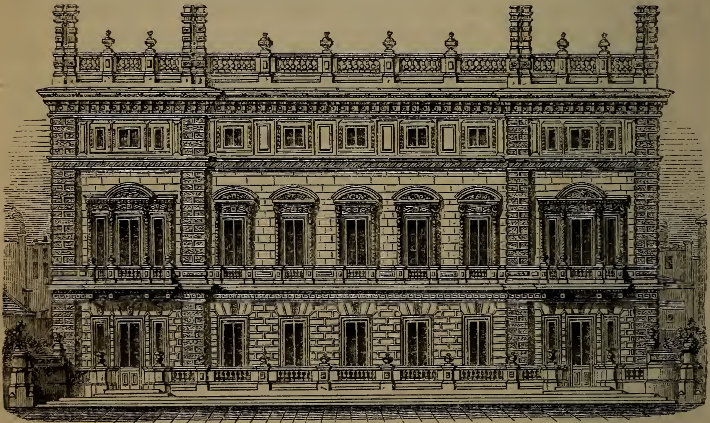
The village where this institution was founded is about five miles distant from London, in a southerly direction beyond Camberwell, and is one of the most rural and tranquil spots in the vicinity of the metropolis. The college itself was established by a comedian named Alleyn, about three centuries ago, and by his will the preference in electing the inmates is given to those bearing the same name.

In the year 1811 Sir Francis Bourgeois, a Royal Academician, although an indifferent painter, bequeathed his pictures to the Master, Wardens, and Fellows of Dulwich College, in trust for the public use, under the direction of the Royal Academy. The bequest was accompanied by a condition that a mausoleum should be contained in the gallery, where his own remains and those of two friends, Monsieur and Madame Desenfans, should be placed. A separate building attached to the rooms where the pictures hang has, therefore, been erected for the purpose.

The gallery is open to the public every day throughout the year, excepting Friday and Sunday. The admission is entirely by tickets, which are to be had gratis of Messrs. Graves & Co., 6, Pall Mall; Moon, 20, Threadneedle Street; P. & D. Colnaghi, Pall Mall East; Leggatt & Co., Cornhill; and some other printsellers. It is absolutely necessary to be provided with a ticket from one of the above establishments, as no admission is permitted without, and no tickets are to be obtained in Dulwich. A catalogue is sold in the gallery, price *6d.*, containing the titles of the pictures, and the names of the reputed masters, but it is much to be regretted that it should be such an imperfect guide to the amateur and student, for its inaccuracies are numerous.

The pictures of the Bourgeois collection are 354 in number. Six pictures of family portraits, by Gainsborough and Sir Thomas Lawrence, have subseqently been presented, as well as a large picture, by C. Procacini, of the Creation of Eve. Most of the great painters of the ancient schools have their names placed in the catalogue; but probably there exists no similar official document so full of errors of description, the most worthless performances being intermingled with really fine works, and many pictures also falsely attributed. By the donor of the collection, Sir Francis Bourgeois, there are 14 pictures; by N. Berghem, 5; by Agostino Caracci, 5; by Annibal Caracci, 2; by Ludovico Caracci, 3; by Claude, 7; by Cuyp, 18; Carlo Dolce, 3; Gerard Dow, 3; Guercino, 3; Guido, 6; Hobbima, 3; C. Du Jardin, 5; F. Mola, 4; Murillo, 12; A. Ostade, 4; Paul Potter, 5; N. Poussin, 17; G. Poussin, 4; Rembrandt, 5; S. Rosa, 5; Rubens, 18; J. Ruysdael, 4; D. Teniers, 18; W. Vandevelde, 4; Vandyck, 13; Van Huysum, 4; Velasquez, 4; P. Veronese, 5; P. Wouvermans, 11; Wynants, 3; and Zuccarelli, 5. Among this mass of authentic and non-authentic works, besides those attributed to other painters, there are many very important performances. The numerous Cuyps are of varied excellence; three or four of them are of supreme beauty. The same may be said of the 18 specimens by David Teniers. Cattle at a Fountain by Berghem, No. 209, is a brilliant picture, which has been frequently engraved. The Jacob's Dream, by Rembrandt, No. 179, is a singularly poetical conception. The pictures by Rubens and Vandyck comprise some good portraits. The greatest ornaments of the gallery are unquestionably the Murillos, which are of his very best quality; among them, the Virgin surrounded by heavenly splendour, enthroned in the air with angels, No. 347; the Flower Girl, No. 48; and the pair of Spanish Peasant Children, Nos. 283 and 286; may be cited. Several of the pictures by Nicholas Poussin are also very fine; and the same may be said of the many examples by Philip Wouvermans. The English school may boast of three fine portrait subjects by Gainsborough; but Sir Joshua Reynolds is ill represented by a picture, No. 143, called a Mother and Sick Child, and by No. 340, of Mrs. Siddons as the Tragic Muse, which is no more than a copy made by Sir F. Bourgeois, after the original picture in the Grosvenor Gallery; and, to complete the inaccuracies of the catalogue, Sir J. Reynolds's name is omitted among the artists whose numbers of the pictures are added thereto. However, the visitor will be amply recompensed by the view of an excellent gathering of fine pictures, notwithstanding the presence of many unworthy specimens.

THE COLLECTION OF PICTURES BELONGING TO THE EARL OF ELLESMERE, CLEVELAND SQUARE, ST. JAMES'S.



RESIDENCE OF LORD ELLESMERE.

This famous gallery was formed principally from the collection of the Palais Royal, belonging to the Dukes of Orleans, by the late Duke of Bridgewater, who availed himself largely of the opportunity. Hence it is sometimes called the Bridgewater Gallery; and having passed, at the decease of that nobleman, to his nephew, the Marquess of Stafford, it is also frequently called the Stafford Gallery. The present possessor, the Earl of Ellesmere, the second son of the late Marquess of Stafford, has made several important additions; and it now ranks the first, in importance and number, of all the private collections in England. Its consequence may be judged of by saying that many of the pictures are of the very highest class, and rank among the great landmarks of pictorial art. Among them are 4 by Raffaelle, 5 by Titian, 7 by Annibal Caracci, 5 by Ludovico Caracci, 5 Domenichinos, 4 Claudes, 8 Nicolo Poussins, 5 Berghems, 6 Cuyps, 6 by A. Ostade, 4 by Rembrandt, 8 of D. Teniers, 7 of W. Vandevelde, &c. A sumptuous gallery has been erected to contain them, in Cleveland Row, on the site of Bridgewater House, to which, it is believed, the public will be admitted, under restrictions, and is expected to be opened in the year 1851: for the present, they have not been arranged. The following is a list of them as they now stand in the apartments in Belgrave Square.

Tintoretto. Portrait of a Gentleman; from the Orleans Gallery.

Bourgogone. An Italian Landscape.

N. Poussin. Seven famous Pictures of the Seven Sacraments; from the Orleans Gallery. Moses Striking the Rock; from the same.

F. Mille. An Italian Landscape.

Leandro Bassano. The Last Judgment; from the Orleans Gallery.

Titian. The "Venus à la Coquille;" formerly belonged to Queen Christina of Sweden, afterwards in the Orleans Gallery.

Paris Bordone. Holy Family; from the same.

Alessandro Veronese. Joseph and Potiphar's Wife; from the same.

Palma Vecchio. Holy Family in a Landscape.

Spagnoletto. Christ Disputing with the Doctors in the Temple; from the Orleans Gallery.

Titian. Portrait of Pope Clement VII.; from the same.

Valentin. A Musical Party of Five Figures.

Domenichino. The Vision of St. Francis; from the Orleans Gallery.

N. Berghem. Landscape and Cattle; from the Calonne collection.

Dobson. Portrait of Cleveland, the Poet.

Rembrandt. Portrait of Himself; from the Holderness collection.

Tintoretto. Portrait of a Venetian Gentleman; from the Orleans Gallery.

D. Calvert. The Entombment.

Domenichino. Head of St. Agnes.

Annibal Caracci. St. John in the Wilderness; from the Orleans collection.

Titian. The Four Ages; formerly belonged to Queen Christina, and afterwards in the Orleans Gallery.

Palma Vecchio. Portrait of a Doge; from the same.

Paul De la Roche. King Charles First Prisoner.

Annibal Caracci. St. John Sleeping; from the Orleans collection.

Ludovico Caracci. The Vision of St. Catherine; from the same.

Domenichino. Christ Bearing his Cross; from the same.

Ludovico Caracci. The Madonna and Christ, with St. John and Mary Magdalen; copied from the Picture, by Coreggio, at Parma.

Titian. Diana and Calisto; a large and wonderfully fine work, painted, according to Vasari, for Philip II. of Spain; from the Orleans collection.

Tintoretto. The Entombment; from the same.

Andrea Sabbatini di Salerno. St. Catherine. The Companion, St. Rosalie.

D. Teniers. The Village Wedding.

Annibal Caracci. St. Francis Adoring the Infant Jesus; from the Orleans Gallery.

P. P. Rubens. Mercury Carrying Hebe to Olympus; from the Geldermeester Cabinet.

Vandyck. Portrait of a Gentleman with a Lace Collar.

N. Berghem. Italian Landscape, with figures; from the collection of Mons. de Calonne.

Hobbima. Landscape, Cottages among Trees.

W. Vandevelde. Sea View off the Dutch Coast.

Terburg. "L'Instruction Maternelle."

S. Rosa. Coast Scene, "Les Augures;" from the collection of the Duc de Praslin.

W. Vandevelde. The celebrated large Sea Piece.

Hobbima. Landscape, with Figures by Wouvermans. The Water Mill.
J. Ruysdael. The Charcoal Burners.
G. Metzu. Cavalier Refreshing at the Door of a Mansion.
Vander Heyden. Town Scene in Holland, Figures by Adrian Vandevelde.
Velasquez. Portrait of Himself.
Vandyck. The Virgin and Child.
Rembrandt. Portrait of a Dutch Lady.
Elizabeth Sirani. The Magdalen.
S. Koninck. The Student.
J. and A. Both. Rocky Landscape, with Figures.
Paul Potter. Oxen in a Meadow; dated 1650.
Cornelius Bega. Interior; from the Cabinet of Greffier Fagel.
W. Vandevelde. A Fresh Breeze.
J. Van Huysum. Flowers in a Vase.
Rembrandt. Study of a Man's Head.
A. Ostade. An Interior, Peasants Drinking and Smoking; from the Geldermeester Cabinet.
Van der Capella. View on a River in Holland.
J. Wynants. Landscape with Figures by A. Vandevelde.
Rembrandt. The Prophetess Hannah, with her Son in the Temple; from the Julienne Cabinet.
W. Vandevelde. A Naval Engagement.
A. Cuyp. The Landing of Prince Maurice at Dort; from the collection of Van Slingelandt. Of this wondrous picture, Dr. Waagen says, "This is one of the most celebrated of Cuyp's works, and of the Dutch school the finest in the collection. It looks as if the painter had dipped his pencil in light, to express the play of the sun-beams which have dispersed the morning mist upon the water and the ship."
J. Wynants. Landscape, with Figures by A. Vandevelde.
W. Vandevelde. Entrance to the Brill, a Light Breeze.
N. Maas. A Girl Threading her Needle.
G. Dow. A Portrait of Himself.
G. Metzu. A Woman Selling Fish at a Stall; from the Geldermeester collection.
A. Vandevelde. Cattle in a Landscape.
J. Wyck. The Effects of War; Soldiers Pillaging.
G. Coques. Portrait of Elizabeth, Princess Palatine.
Van Tol. An Old Woman at a Window with a Dog.
C. Poelemberg. Landscape, Buildings and Figures.
C. Netscher. The Duchess of Mazarine and M. St. Evremont, as Vertumnus and Pomona.
A. Pynacker. Landscape, Mountainous Scenery.
D. Teniers. An Interior; Peasants Playing at Cards.
P. Lauri and Maria di Fiori. Three Cupids Sporting.
Mignard. The Virgin, Infant Christ, and St. John.
Eglon Van der Neer. The Juvenile Drummer.
Annibal Caracci. St. Gregory attended by Angels. In the Anecdotes of Painting by Mr. Buchanan, he says, "The famous picture of the Saint Gregorio, from the church of that name in Rome, is one of the most capital works of the high school of painting. In this magnificent picture is seen how near Annibal has approached the finest works of Corregio. In point of drawing and sentiment he has rivalled the most renowned pictures of Raffaelle."
Ludovico Caracci. The Marriage of St. Catherine.
A. Tiarini. The Holy Family.
Gonsales Coques. Portrait of David Teniers.
G. Dow. Portrait of Himself holding a Violin. According to Dr. Waagen, this little picture is only equalled by the celebrated "Evening School" at Amsterdam.
F. Mieris. A Lady at her Toilet.
Corregio. "La Vierge au Panier;" from the Orleans Gallery.
Rottenhammer. The Nativity.
Ary de Voys. Portrait of a Student with a Book.
Ludovico Caracci. Descent from the Cross; formerly in the collection of the Duke of Modena, and the Orleans Gallery.
C. Cignani. "Noli me tangere;" from the Orleans Gallery.
P. du Cortona. Adoration of the Shepherds.
A. Ostade. A Dutch Peasant; from the Duc de Chabot's Cabinet.
Isaac Ostade. Village Scene, Peasants Regaling.

Jan Steen. The Schoolmaster. A first-rate work of the Painter; from the Marquess Camden's collection.
Bourgognone. A Conflict of Cavalry.
Isaac Ostade. Travellers Halting at a Country Inn.
D. Teniers. A Village Kermesse.
G. Coques. Portrait of Frederic, King of Bohemia.
W. Mieris. A Musician Seated, taking Refreshment.
C. Poelemberg. Landscape, with Nymphs Bathing.
G. Van Harp. A Musical Party.
S. del Piombo. The Entombment; from the Orleans Gallery.
Corregio. Head of Christ Crowned with Thorns.
Baldazzar Peruzzi. The Adoration of the Magi; from the Orleans Gallery.
P. Wouvermans. A Large Battle Piece; from the collection of Cardinal Fesch.
Guido. The Assumption of the Virgin. A magnificent altar-piece; from the Cathedral of Seville.
Lanfranco. The Vision of St. Francis.
G. B. Mola. St. John Baptising the Saviour.
Raffaelle. "La Madonna del Passegio." A renowned work. It has been successively possessed by the Duke of Urbino, Philip II. of Spain, Rodolph II., Emperor of Germany, Gustavus Adolphus, King of Sweden, Queen Christina of Sweden, the Duke of Bracciano, and the Duke of Orleans.
Domenichino. Grand Landscape, with Fishermen; from the Orleans Gallery.
Schidone. The Virgin Instructing the Infant Saviour to read; from the Orleans Gallery.
Guido. The Virgin with a Sampler.
Raffaelle. "La Vierge au Palmier." A renowned Picture, which has been frequently engraved; after passing into many celebrated collections, it came into the Orleans Gallery.
L. da Vinci. Female Head; from the Orleans Gallery.
Guido. The Infant Christ Sleeping on a Cross; from the same.
Parmegiano. The Virgin, Infant Christ, and St. John.
Raffaelle. The Virgin and Infant Saviour. This is also a celebrated picture by the divine master, and has always been designated by the title of "La plus belle des Vierges;" from the Orleans Gallery.
Sir P. Lely. Portrait of a Young Lady.
Bourgognone. Battle Piece.
Dobson. Portrait of King Charles I.
L. Backhuyzen. A Breeze, View off the Dutch Coast.
J. Ruysdael. View in Holland, a Windmill, &c.
D. Teniers. The Alchymist; from the Orleans Gallery.
Palma Vecchio. The "Reposo;" from the same.
Claude. Landscape, Evening, with Moses and the Burning Bush.
Titian. Diana and Actæon. One of the most glorious works of the painter; from the Orleans Gallery.
Schiavone. The Marriage of St. Catherine.
Claude. View on the Sea Shore, Morning.
F. Mieris. An Interior, with a Woman Scouring a Pan.
G. Poussin. Landscape, a Valley surrounded by Hills.
J. Ruysdael. Landscape, with a Peasant and Sheep.
P. Slingelandt. Interior of a Kitchen, with Figures.
G. Poussin. Landscape, with a Ruin.
J. Ruysdael. Hilly Landscape, with a River.
J. Wynants. Landscape, with Figures Fishing.
C. Du Jardin. Mountainous Landscape and Figures.
Jan Steen. The Fishmonger.
Claude. Landscape, with Cattle, Morning.
Rembrandt. Portrait of a Burgomaster; from the Geldermeester Cabinet.
Claude. Landscape, with the Apulian Shepherd.
N. Berghem. Landscape, Rocky Scene, with Figures.
C. Netscher. An Interior, with Figures in Conversation.
J. Ruysdael. View near Haerlem.
W. Vandevelde. The Great Naval Battle between the English and French Fleets in 1606.
Sasso Ferrato. The Head of the Virgin.
Sir Peter Lely. Portrait of the Countess of Middlesex.
Sir Joshua Reynolds. Portrait of Lord and Lady Clive.
Annibal Caracci. Christ on the Cross; from the Orleans Gallery.
G. Poussin. The Environs of Tivoli.

Raffaelle. "La Vierge au Diadême," a celebrated composition, of which there is a replica in the Louvre.
S. Rosa. Large upright Mountainous Landscape.
Mireveldt. Portrait of a Gentleman.
A. Cuyp. Landscape; from the Calonne collection.
A. Ostade. A Lawyer in his Study.
Rottenhammer. Children Standing in a Circle.
R. Wilson. Grand Landscape, with the Story of Niobe.
A. Cuyp. Ruins of the Castle of Koningsvelt.
G. Dow. Woman at a Window Selling Herrings.
A. Ostade. An Interior, with Three Workmen.
C. Dusart. An Interior, with Peasants Gambling.
Van Tol. An Old Woman Reading.
N. Berghem. Landscape and Figures, Evening Scene.
Velasquez. Whole-length Portrait of the Son of the Duc d'Olivares; from the Altamira Gallery, Madrid.
G. Metzu. A Lady in a Scarlet Tunic.
Van Tol. The Tired Musician Reposing.
D. Teniers. Peasants Playing at Skittles.
Grimoux. Copy from the Good Shepherd, by Murillo.
A. Ostade. Boors Playing at Nine Pins.
A. Brauwer. Boors Singing.
W. Vandevelde. Calm, Early Morning; from the collection of the Prince de Conti.
D. Teniers. An Interior, Peasants Smoking and Drinking.
Sir J. Reynolds. Whole-length Portrait of a Lady.
A. Ostade. The Lawyer and Client; from the Cabinet of Greffiers Fagel.
Van Tol. An Old Man Reading.
Steenwyck. Interior of a Church by Moonlight.
D. Teniers. Peasant Carrying a Basket, in a Landscape.
P. P. Rubens. St. Theresa Praying for Souls in Purgatory.
P. Wouvermans. Grooms Watering Horses at a Stream.
R. Mengs. A Portrait.
J. Both. Ruins of a Gateway, Figures by Poelemberg.
A. Ostade. "The Proposal," a celebrated work.
D. Teniers. A Butcher Dressing a Pig, Winter Scene.
Van Os. Fruit and Flowers on a Marble Slab.
P. Wouvermans. Boys Bathing, and many Figures.
F. Albano. A Reposo, with Angels; from the Orleans Gallery.
Murillo. Lazarus at the Rich Man's Door.
P. Lauri. The Reposo, with Angels.
Van Thulden. The Three Kings, after Rubens.
J. W. M. Turner, R.A. A Large Sea Piece, painted as a companion in rivalry to the grand picture by W. Vandevelde in this collection.
P. Veronese. Venus Lamenting the Death of Adonis; formerly belonged to Christina of Sweden, and afterwards to the Orleans Gallery.
Annibal Caracci. Tantalus.
Rembrandt. Portrait of a Lady.
Polidoro di Caravaggio. A Procession of Nymphs.
O. Marinari. The Saviour, and the Virgin, companion pictures.
A. Schiavone. Christ before Pilate; formerly in Queen Christina's and the Orleans Gallery.
Verboom. A large Woody Landscape.
Guercino. Saints Adoring the Trinity.
Annibal Caracci. Diana and Calisto; from the Orleans Gallery.
Scarcellino di Ferrara. Christ Appearing to his Disciples; from the same.
Tilborgh. Peasants Regaling at a Cabaret.
H. Zorg. An Interior, with Boors Drinking.
C. Huysman. Landscape, with Figures.
Tilborgh. A Rustic Wedding.
G. Van Harp. Boors Carousing.
C. Huysman. Landscape, and Classical Figures.
Jan Victor. Tobias Parting from his Family.
C. Dusart. Dutch Tavern, with Peasants Regaling.
G. B. Panini. Interior of a Grand Saloon filled with works of Art, and the Companion, St. Peter's at Rome, with a multitude of figures. They are the finest of this artist's work.
A. Cuyp. Landscape and Figures.
J. Vernet. A Tempest on the Sea Coast.
Gainsborough. Landscape and Cattle in a Meadow.
C. Molenaer. A Peasant's Wedding.

H. Steenwyck. Interior of a Church in Antwerp.
J. Vernet. A Calm on the Coast of Italy.
C. De Heem. Composition of Fruit and Flowers.
Decker. Landscape, with Cottages on a River Side.
Roger Van de Weyde. Taking Down from the Cross.
A. Brauwer and D. Seghers. Landscape, encircled by Flowers.
A. Jansens. A Peasant Cleaning a Jug.
J. Wynants. Landscape, Figures by Lingelbach.
A. Cuyp. Cows in a Landscape, with Rocks.
Gessi. The Virgin in Adoration.
Wildens. A Landscape, Forest Scenery.
Peter Wouvermans. A Battle.
P. Van Lint. A Musical Party.
Richard Wilson. An Italian Landscape.
J. Van Hugtenberg. A Combat of Cavalry.
F. Monzani. Cephalus and Procris.
C. De Heem. Fruit Piece, Grapes, Peaches, &c.
J. Artois. Woody Landscape, Figures by D. Teniers.
C. Schut and Daniel Seghers. The Virgin and Child in a Garland of Flowers.
N. Berghem. Large Landscape, Heath Scene.
Langen Jan. The Assumption of the Virgin.
Breckelenkamp. An Old Woman Frying Pancakes.
J. Breughel. A City on Fire by Night.
F. Hals. Portrait of a Lady Wearing a large Ruff.
Ludovico Caracci. Dead Christ and the Weeping Maries.
G. Poussin. Mountain Scenery; from the Colonna Palace.
P. Lauri. Bacchus and Satyrs.
D. Stoop. A Traveller Reposing.
Lorenzo Lotti. The Virgin and Child.
A. Kierings. Landscape, Figures by C. Poelemberg.
Julio Romano. The Nursing of Hercules; from the Orleans Gallery.
Peter Wouvermans. Horses in a Landscape.
A. Van der Neer. View in Holland, Moonlight.
A. Waterloo. A Forest Scene.
Blankhof. A Fresh Breeze on the Coast of Italy.
H. Roos. Cattle in a Landscape.
A. Van der Neer. A Dutch Village, by Moonlight.
J. Wynants. A Landscape.
Ghisolfi. A Grand Architectural Composition.
J. Asselyn. View of the Ponte Mole on the Tyber.
F. Mille. Landscape, Buildings, and Figures.
Polidoro da Caravaggio. Passage of the Red Sea.
Ghisolfi. Architectural Scene, with a Triumphal Arch.
H. Swaneveldt. Landscape, River and Figures.
De Vlieger. View on the Dutch Coast.
Craesbeck. A Peasant Placing a Plaster on his Head.
W. Vandevelde. Large Marine Coast Scene.
A. Cuyp. Evening, Travellers Halting at an Inn.
J. Wyck. Battle of Cavalry near a Fortress.
F. Mille. Landscape and Figures.
Tintoretto. Presentation in the Temple.
J. Ruysdael. Landscape on the Banks of a River.
W. Vandevelde. A Small Sea Piece.
Sir Joshua Reynolds. Portrait of the Bishop of Rochester.
Paul Bril. Landscape, with Figures by Annibal Caracci, from the Duc de Choiseul's Collection.
Van der Leeuw. Landscape and Cattle.
Moreelze. Zacharias Holding the Infant Saviour.
F. Snyders. Two Dogs, Fruit, &c.
Domenichino. Grand Landscape and Figures.
Hondekoeter. Poultry and other Birds.
Paul Veronese. The Judgment of Solomon; a large Composition of Twenty Figures; from the Orleans Gallery.
Guercino. David and Abigail, also a large gallery picture, and from the same collection.
Parmegiano. Cupid Carving his Bow; a renowned picture painted for the Chevalier Bayard; it afterwards belonged to Queen Christina, and thence passed into the Orleans Gallery.
S. Rosa. Jacob Watering his Flock.
Schiavone. A Copy of Titian's Last Supper.
Vargas. St. John, a life-size Figure.
Annibal Caracci. Danaë; from the Orleans Gallery.

The preceding catalogue is taken as the pictures are now hung; there are also a few modern pictures; and the corridors are hung with the drawings by the Caracci, which formed part of Sir Thomas Lawrence's vast collection.

THE FOUNDLING HOSPITAL.

This institution was founded in 1739, when it received a charter from the sovereign. The title sufficiently indicates its object; and its primitive conception arose from purely humane motives, however sceptical many may now be as to its moral effects. In the earliest years of its establishment, the artists of the period appear to have peculiarly fostered its pecuniary resources, by contributing their pictures; the voluntary exhibition of which so much engaged the public, that it first engendered the idea of an exhibition among themselves, and by degrees led to the establishment of a Royal Academy of Art, and an annual exhibition of works of fine art in its galleries. As it is only at the Foundling Hospital that a number of pictures by the earliest of our native painters can be viewed together, the following catalogue may prove interesting:—

Hagar and Ishmael. Joseph Highmore.
Little Children brought to Christ. James Wills.
The Finding of Moses. Francis Hayman, R.A.
Moses brought to Pharaoh's Daughter. W. Hogarth.
Greenwich Hospital; Christ's Hospital; St. Thomas' Hospital; all painted by Samuel Wall, R.A.
Chelsea Hospital; Bethlem Hospital; painted by Haytley.
The Charter House. Thomas Gainsborough, R.A.
St. George's Hospital; the Foundling Hospital; painted by Richard Wilson, R.A.
A Basso-Relievo in Marble, by Rysbrack.
The March to Finchley. W. Hogarth. This remarkable production, well known by the engraving, is replete with characteristic figures, and ranks with the happiest emanations of the painter's mind. It was offered when finished to the chance of a lottery, and the several tickets remaining unsold, were given by Hogarth to the Hospital. Among these was the fortunate number that gained the prize.
A large Sea Piece. Brooking.
A Landscape. George Lambert.
Elijah Raising the Widow's Son, by Lanfranco; a present made by Mr. Langford, an auctioneer.
Portrait of Handel. Sir Godfrey Kneller.
Portrait of Taylor White, Esq. Francis Cotes, R.A.
Portrait of Charles Pott, Esq. T. Phillips, R.A.
Offering of the Wise Men. Andrew Casali.
Action off the Coast of France. Luny.
Portrait of Lord Chief Baron Wilmot. Dance.
Portrait of George the Second. Shackleton.
Portrait of the Earl of Dartmouth. Sir J. Reynolds.
Portrait of the Earl of Macclesfield. Wilson.
Portrait of Dr. Mead. Allan Ramsay.
Portrait of Theodore Jacobsen, Esq. Thomas Hudson.
Portrait of Captain Coram. Hogarth.
Portrait of Thomas Emmerson, Esq. J. Highmore.
A large Sea Piece. Monamy.
Christ Blessing Little Children; the altar-piece in the Chapel; painted by Benj. West, P.R.A.

Application to see the preceding pictures may be addressed to the secretary, John Brownlow, Esq.

The Foundling Hospital ordinarily maintains 500 children; the condition for reception must be, that they are of illegitimate birth, or orphans of the Army and Navy. In the first establishment of the charity, indiscriminate reception took place of children of married parents; but great difficulty ensuing in choosing among the candidates who presented the children for admission, an absurd resolution was taken, of hanging a basket at the gate to receive the infants. This led to the most intolerable abuse, nearly 100 being abandoned weekly, many in the most deplorable and diseased condition. At present great pains are employed to prevent abuse, and the preference is always given where the opportunity of a return to virtue by a concealment of the shame may assist to restore the erring sufferer to future station in society.

THE GOVERNMENT SCHOOL OF DESIGN, SOMERSET HOUSE, STRAND.

This school was opened here, in 1837, as a national institution, under the superintendence of the Committee of Her Majesty's Privy Council for Trade, to offer instruction to all who desire to obtain a knowledge of ornamental art, and to supply a systematic course of education, in relation to every kind of decorative work, to such persons as are, or are intended to become, designers for the various manufactures of the country. Drawing, painting, and modelling are taught in all the branches which have reference to the purposes and requirements of ornamental art, or which may be applicable to objects of manufacture dependent on form or pattern.

The fees for instruction are two shillings a month for the morning school, and two shillings a month for the evening school. The hours of attendance are—for the elementary class in the morning, from ten until one. The advanced classes, from ten to three. In the evening, all the classes from half-past six to nine. Instruction is given as above, every day, excepting Saturday. The principal masters are—J. R. Herbert, R.A.; R. Redgrave, A.R.A.; H. J. Townsend, Esq.; and C. J. Richardson, Esq. There is also a class for female students, directed by Mrs. M'Ian.

All persons who wish to enter the school are required to state in which branch of manufacture their studies are intended to be applied; and to be furnished with a recommendation from any respectable tradesman or other person. A prospectus, detailing the various particulars, is given to any one desirous of entering the school, on application to the secretary.

The institution possesses an excellent collection of designs and casts, a lending library to the students of a thousand volumes of works relating to their studies, and latterly the acquisition has been made of a capital series of copies from the arabesques and lunettes by Raffaelle, in the Vatican. There is a branch school at Spitalfields, in connection with the Somerset House institution. The accommodation will allow of 400 male students and 70 females. Visitors are permitted to view the schools during the hours of study, on application at the entrance, which is in the western portico, leading from the Strand.

GREENWICH HOSPITAL.

The spacious apartment, commonly called the Painted Hall, is a double cube of 56 ft.; the ceiling and side-walls being wholly decorated with paintings of allegorical subjects by Sir James Thornhill, which, with the rich gilding of the architectural details, form a truly gorgeous combination. In the year 1823, it was devoted to the reception of pictures relative to the naval grandeur of England, either of historical subjects of her great victories, or of portraits of the most famous naval commanders. His Majesty George IV. became a most liberal contributor, on the formation of the collection, by presenting a considerable number of authentic portraits, which adorned the royal collections, and some other pictures; and his Majesty William IV. peculiarly fostered it, by numerous valuable contributions. It now comprises altogether 139 pictures, besides statues, busts, and models of vessels.

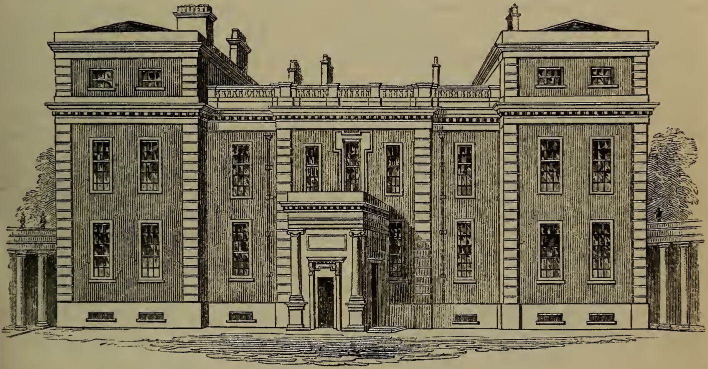
Among the pictures of naval engagements, are eminently conspicuous—the Defeat of the Spanish Armada, by Loutherbourg, R.A.; the Battle of June 1st, 1794—Lord Howe's victory—by the same; the Capture of Porto Bello, in 1739, by George Chambers; the Bombardment of Algiers, in 1816, by Lord Exmouth, painted by the same; and the Battle of Trafalgar, by J. M. W. Turner, R.A. Many of the portraits are copies from the originals existing in the families of the descendants; there are, however, some of them the originals, painted by Zucchero, Sir Peter Lely, Sir Godfrey Kneller, Sir J. Reynolds, &c. On a pedestal in the centre of the upper hall is placed the marble bust of William IV., by Sir F. Chantrey, presented to the hospital by her late Majesty the Queen Dowager Adelaide; and here also stood statues of Sir Sidney Smith, Lord Exmouth, and Lord de Saumarez. Under a glass shade is placed the curious astrolabe presented by Queen Elizabeth to Sir Francis Drake; and in cases, similarly preserved, are, the coat worn by Nelson at the Battle of the Nile, and the coat and waistcoat he wore, in which he received his death-wound, at the Battle of Trafalgar—the waistcoat abundantly stained with the blood of the dying hero. This coat and waistcoat were presented to the hospital by his Royal Highness Prince Albert.

The hall, including the chapel, is always open to the public, by a payment of 4*d.*, which goes to the general fund; and a detailed catalogue of the pictures, with the names of the various persons pourtrayed, and other details, is sold in the hall for 3*d.*

The chapel is very handsomely fitted up. The altarpiece is a large picture by Benjamin West, P.R.A., representing the ship-wreck of St. Paul on the Isle of Malta—the Melita of the Scriptures. The marble columns which support the organ-gallery, and the door-casings of the entrance, are much admired for the material employed.

THE VERNON GALLERY.

This collection, now placed in the rooms on the ground-floor of Marlborough House, comprising 155 pictures, 6 busts, and 1 group of figures in marble, was presented to the nation by Robert Vernon, Esq. The other English pictures, forming part of the National Gallery in Trafalgar Square, 43 in number, have also been removed hither and occupy the first two apartments on passing from the hall. The collection is open to the public gratis, on the first four days of each week throughout the year, with the exception of a month during the autumn.



MARLBOROUGH HOUSE.

The busts and marble group are placed in the entrance-hall, the ceiling of which is adorned with nine allegories of the arts and sciences. This series was painted by Gentileschi, in England, for King Charles I. Among the pictures in the two first rooms on the right-hand side, leading from the hall, are 9 capital works by Sir Joshua Reynolds, 6 by Hogarth, forming the episode of Marriage à-la-Mode, 2 by R. Wilson, 2 by Sir David Wilkie, and others by Lawrence, Gainsborough, Constable, &c. The subjects and names of the painters of all the pictures exhibited here, are detailed in an authenticated catalogue, sold in the hall, by the attendants, for 2*d*. The Vernon collection occupies the remaining six apartments, and is a very flattering display of the English school, if considered as the collection of a private gentleman, formed for his own pleasure, and agreeably to his own taste. There are 11 works of Etty, 9 of Sir A. W. Callcott, 5 by Sir D. Wilkie, 4 by R. Wilson, 7 by Sir Edwin Landseer, 4 by Gainsborough; while some other eminent names appear only by their lesser performances, and some equally eminent names not at all. This reservation is made lest foreigners, who are unacquainted with the English school of art, should accept the Vernon Gallery as its fullest exponent. The whole of the pictures are only placed in Marlborough House, by permission of Her Majesty, until a suitable gallery is erected for the entire of the national pictures; the present edifice being destined for the abode of the Prince of Wales, on attaining his majority.

THE GROSVENOR GALLERY, BELONGING TO THE MOST NOBLE THE MARQUESS OF WESTMINSTER, UPPER GROSVENOR STREET, GROSVENOR SQUARE.

Among the great collections none are more celebrated, or have a greater claim to distinction, than the Grosvenor Gallery, from the importance of the pictures severally, and the extent of fine works it comprises, possessing, among others, 10 pictures by Claude, 11 pictures by Rubens, and 7 by Rembrandt. The mansion where these beauties of art are located is an extensive edifice in Upper Grosvenor Street, with a courtyard facing the street, inclosed by an elegant columniated screen. Many of the pictures are in the various reception-rooms; but the larger ones are placed in a sumptuous gallery, connected with the drawing-rooms, of lofty proportions, and lighted from above. At present the collection can only be viewed by express permission of the noble proprietor. Formerly a day in each week of the months of May and June was set apart for admission by cards of invitation liberally issued; but so much inconvenience was experienced by the family that it has been for some time discontinued. The following is, however, an accurate catalogue of the fine and extraordinary works forming this very important collection:—

ANTE-ROOM.

Jan Fyt. Dogs and Game. Hawks and Birds.
J. J. Chalon, R.A. Landscape and Cattle.
G. Jones, R.A. View in Rotterdam.
A. Canaletti. View in St. Mark's Place, Venice, a very large picture, with hundreds of figures during the Carnival.
T. S. Cooper, A.R.A. Landscape and Cattle.
E. W. Cooke. Elizabeth Castle, Jersey.
Northcote. Portrait of his Brother Holding a Hawk.
Sir Edwin Landseer, R.A. A Dog with a Wild Duck.
Hogarth. A Boy with a Kite entangled in a Tree.
J. Hayter. Portrait of a Gentleman.
F. G. Hurlstone. A Youth with a Parrot.
A. Canaletti. View in Venice.
Penry Williams. Italian Peasants Worshipping the Virgin.
Benj. West, P.R.A. Portrait of a Gentleman.
Gainsborough. Coast Scene, Women Selling Fish.
R. P. Bonington. Coast Scene, with Children and Ducks.
Sir J. Reynolds. A Female Head, as a Madonna.
Gainsborough. The Cottage Door.
R. R. Reinagle. A Landscape.
Loutherbourg. A Coast Scene with Figures.
Hogarth. The Distressed Poet.

THE DRAWING-ROOM.

Murillo. The Infant Jesus asleep.
Bassan. The Adoration of the Shepherds.
Claude. Landscape.

P. Perugino. The Marriage of St. Catherine.
Raffaelle. St. Luke Painting the Virgin's Portrait.
Ludovico Caracci. The Vision of St. Francis.
Carlo Maratti. Hagar and Ishmael. David and Bathsheba. Hermit at Prayers.
Albano. The Triumph of Venus.
Claude. Evening; called also the Decline of the Roman Empire.
Polidori di Caravaggio. St. Peter and St. Paul; a pair of grisailles.
Guido. St. John Preaching in the Wilderness.
Claude. Landscape, Morning; called also, from the introduced accessories, the Rise of the Roman Empire.
J. De Bellini. The Circumcision.
Fra. Bartolomeo. The Holy Family.
N. Poussin. The Israelites Returning Thanks for the Miraculous Supply of Water in the Desert.
Guido. The Infant Jesus asleep, with the Virgin Watching.
Claude. Landscape with a Shepherd.
Corregio. The Holy Family, from Mr. Ellis Agar's collection.
N. Poussin. Infants Playing in a Landscape.
Paul Veronese. The Marriage Feast, small size.
J. De Bellini. The Virgin and Infant, with Saints.
A. Del Sarto. Portrait of the Countess Mattei.
Guido. The Shepherd's Offering.
Baroccio. A Reposo, called "*La Vierge à l'Ecuelle.*"
Gaspar Poussin. Landscape and Figure.
Raffaelle. Virgin, with the Infant Saviour and St. John.
Claude. Landscape, with the Flight into Egypt.
C. Le Brun. The Tent of Darius, a small picture by the artist of one of the subjects forming the series at Versailles.
Sasso Ferrato. The Virgin, Infant Jesus, and St. John.
Domenichino. St. Agnes.
Parmegiano. The Marriage of St. Catherine.
Raffaelle. The Holy Family, with Angels.

INNER DRAWING-ROOM.

L. da Vinci. Virgin, Infant Christ, and St. John.
G. Poussin. Landscape, View of Tivoli.
Titian. The Tribute Money.
Carlo Dolce. Head of a Youth.
Trevisani. Joseph sold by his Brethren.
N. Berghem. 1656. Large Landscape, with Figures dancing.
Velasquez. Portrait of Himself in a Fur Cap.
Paul Veronese. The Annunciation.
N. Poussin. The Holy Family, with Angels.
Ridinger. Stags in a Landscape.
Francesca. The Adoration of the Shepherds.
P. da Cortona. The Angel Appearing to Hagar.
Parmegiano. The Vision of St. John; the finished study for the grand picture in the National Gallery.
Albano. The Virgin and Infant Saviour.
P. da Cortona. The Marriage of St. Catherine.
Murillo. St. John with the Lamb.
B. Denner. The Head of an old Man.
Baroccio. The Entombment of the Saviour.
Raffaelle. St. John the Baptist in the Desert.
D. Occhiali. A View in Venice.
Dekoningh. A large Landscape View in Holland.
Sasso Ferrato. The Head of the Virgin.
Guido. The Holy Family.
Rubens. The Conversion of St. Paul, a sketch. A Study of Angels.
P. Veronese. Virgin and Child; from the Colonna Gallery.
J. Van Huysum. Fruit and Flowers, of the painter's highest excellence; from the Braancamp, Geldermeester, and Watson Taylor cabinets.

ANTE DINING-ROOM.

Albert Cuyp. Landscape and Figures.
Rembrandt. Portrait of Himself when young.
D. Teniers. An Interior, Peasants Saying Grace.
Paul Potter. Cattle in a Landscape, dated 1647, when the painter was in his twenty-second year, and executed for the enlightened connoisseur of the epoch, M. Van Slingelandt of Dort.

Words can scarcely do justice to this extraordinary delineation of nature under the effect of afternoon sunshine, which may without exaggeration be called a miracle of art in its peculiar class.

Le Nain. A Landscape, with Itinerant Musicians.

D. Teniers. An Interior, with Flemish Peasants.

P. Wouvermans. The Horse Fair; a first-rate work.

Albert Cuyp. A Group of Sheep.

P. P. Rubens. Landscape, a View in Flanders.

A. Vandevelde. A Farm House with Cattle.

Rubens. Hagar dismissed by Sarah.

Rembrandt. Portrait of a Gentleman Holding a Hawk. This and the companion one of a Lady, rank with the very finest portraits ever painted.

Van Goyen. A View of Nimeguen.

Vandyck. The Virgin, Child, and St. Catherine.

Rembrandt. Lady with a Fan; the companion picture to the above-named admirable performance. The Portrait of Nicholas Berghem.

Albert Cuyp. A View of Dort.

A. Vanderwerff. Repose on the Flight to Egypt.

J. and A. Both. An Italian Landscape.

Rembrandt. The Meeting of Saint Elizabeth and the Virgin. A picture of similar execution and high quality with that of "The Woman Taken in Adultery," in the National Gallery. It was formerly in the gallery of the King of Sardinia.

G. Dow. The Nursery; from the Choiseul Gallery.

Rembrandt. Portrait of the Wife of N. Berghem.

A. Cuyp. Scene by Moonlight.

THE GALLERY.

Benj. West, P.R.A. The Death of General Wolfe. Cromwell Dissolving the Long Parliament. The Landing of King Charles II. at Dover.

Claude. A pair of companion Landscapes, called "Morning" and "Evening;" which may be truly described as the perfection of elegant and poetical landscape.

Titian. Portrait of a Lady Holding the Tresses of her Hair; a well-known and frequently-engraved work.

Raffaelle. The Holy Family and St. John.

Claude. The Israelites Worshipping the Golden Calf.

Titian. The Woman Taken in Adultery; from the Barberini Palace.

Snyders. A large Picture of a Boar Hunt.

Sir J. Reynolds. Mrs. Siddons as the Tragic Muse. A famous picture, worthy of its extended renown, and of the great painter who executed it. It will always be one of the great landmarks of the English school for all the higher qualities of fine art.

Claude. Landscape, with Christ Preaching from the Mount to his Disciples.

Titian. A large Landscape, with a Sleeping Nymph in the foreground, and the City of Cadore in the distance.

Ludovico Caracci. The Holy Family.

Velasquez. The Prince of Asturias, when young, on Horseback.

O. Marinari. The Virgin Mary.

Rembrandt. A large Landscape, with Figures by D. Teniers. The picture was always kept by the latter painter for his own gratification, and never sold until his death.

Claude. Landscape, with Figures dancing.

Domenichino. The Meeting of Abigail and David in a Landscape.

Benj. West, P.R.A. The Battle of La Hogue.

N. Poussin. Landscape, with Arcas and Calisto.

D. Teniers. The Painter and his Family Regaling; from the Verhulst and Lebrun Galleries.

Benj. West, P.R.A. The Battle of the Boyne.

Gaspar Poussin. A Landscape.

Salvator Rosa. The Portrait of Himself.

M. Hobbima. Forest Scene, with Figures by Lingelbach.

P. P. Rubens. Portraits of Himself and his first Wife, as Pausias and Glycera; the garlands and flowers are painted by Breughel.

Zuccarelli. Landscape, with Macbeth and the Witches.

Horizonti. An Italian Landscape.

Hobbima. Forest Scenery, the companion of the preceding; both remarkable for size and perfection.

P. P. Rubens. Ixion Embracing the False Juno.
S. Rosa. The Three Maries at the Tomb of Jesus.
Coello. Saint Veronica.
Guido. Fortune, an Allegory, engraved by Sir R. Strange.
Andrea Sacchi. Saint Bruno.
S. Rosa. Diogenes throwing away his Cup.
Murillo. Grand Landscape, with the Meeting of Jacob and Laban; from the Santiago Palace at Madrid.
Gainsborough. A whole-length Portrait of Master Ruthall, usually called the Blue Boy, from the painter having chosen, contrary to received notions, to compose a picture of entirely cold colours.
Andrea del Sarto. Holy Family and St. Elizabeth.
P. P. Rubens. Four colossal pictures from the Convent of Loeches, near Madrid. It was on the acquisition of these gorgeous works that the late Marquess erected the grand gallery where they are placed. The subjects are—'Abraham and Melchisedek;" "The Israelites gathering the Manna;" "The Four Evangelists;" and "The Fathers of the Church." Rubens painted them for Philip IV. of Spain; and being presented by this sovereign to the Duc d'Olivarez, he in turn gave them to the Convent of Loeches, from whence they were abstracted during the Peninsular War.

On a stand in this gallery is a wonderful small picture, within folding-doors, painted by Memling. Although of such early date, it is in the most perfect condition, retaining its primitive brilliancy. The central compartment contains our Saviour, with the Virgin Mary on one side, and St. John the Evangelist on the other. The Volets represent St. John the Baptist, and Mary, the sister of Martha and Lazarus, with the pot of ointment. All the figures are half length; the execution is of the most surprising elaboration. Some excellent sculptures, vases, and rarities of virtù complete the grand collection famed as the Grosvenor Gallery.

THE GUILDHALL OF THE CITY OF LONDON, KING STREET, CHEAPSIDE.

The grand banqueting-hall, entered immediately on passing the porch, is a fine and spacious apartment, in which the civic feast is annually given on the accession of a new lord mayor. The style is of the Gothic character; but the details have not been very purely preserved in the changes and repairs it has undergone. At the west end, in the angles, the two colossal wooden statues, called Gog and Magog, are placed. They are painted in gay colours; one appears habited in Roman costume, and the other would appear by the attire to be, in all probability, the effigy of an ancient Briton. Four vast monuments of allegorical figures, and statues of life size, of the individuals they are destined to commemorate, are dedicated to Lord Nelson, sculptured by J. Smith; Alderman Beckford, by Moore; the Earl of Chatham, by J. Bacon; and William Pitt, by J. G. Bubb.

The Court of Aldermen.—This is a small apartment, richly decorated, having a very highly ornamented ceiling, divided into five compartments, with a profusion of gilding. The central compartment is filled by an allegorical representation of the City of London and its attributes, personified by female figures. In the four small compartments around this, youths are delineated emblematical of Prudence, Justice, Temperance, and Fortitude. Over the chimney is another allegory, composed of figures also relating to the importance of the City of London; this is imitative of a bronze casting. All these pictures were painted by Sir James Thornhill, and are well worthy of his pencil. The corporation of the city were so gratified by their execution, that they presented the painter, in the year 1727, when the pictures were finished, with a gold cup valued at 225*l.* 7*s.*

The Court of Common Council.—The principal part of the pictures which are preserved in this room were presented by Alderman Boydell, whose name is justly recorded as one of the great founders of art in England, by his long and successful labours as a publisher of copperplate engravings. On the west side, in the centre, stands on an elevated pedestal the statue of George III., by Sir Francis Chantrey. On the right hand is a full-length portrait of Queen Victoria in her robes, by Sir G. Hayter. On the opposite side are half-lengths of Caroline, wife of George IV., and of her daughter, the Princess Charlotte, both by Lonsdale. In the angles are the busts of Nelson, by Mrs. Damer, and of the Duke of Wellington, by Turnerelli. Above are three allegorical grisailles as a frieze.

NORTH SIDE.

Portrait of R. Clark, City Chamberlain. Sir T. Lawrence.
Portrait of Daniel Pinder, Esq. J. Opie.
Portrait of Alderman R. Waithman. Patten.
Portrait of Alderman Sir M. Wood. Patten.
A Bust of Granville Sharp, Esq., by Chantrey.
Portrait of Lord Nelson. Sir W. Beechey.
Sir William Walworth killing Wat Tyler in Smithfield. Northcote.
Admiral Lord Duncan. Hopnner.
The Defence of Gibraltar, Sept. 13, 1782. Paton.
Rodney's Defeat of the French Fleet on April 12, 1782. Dodd.
The Gunboats off Gibraltar burning, Feb. 13, 1782. Paton.
The Bust of Lambert Jones, Esq. Behnes.
Whole length Portrait of Lord Denman. Mrs. Pearson.

THE EAST SIDE.

The Siege of Gibraltar. J. S. Copley. This picture occupies the entire side, and is well known by the engraving. General Elliott is seen on horseback directing the batteries, and all the direful effects on the enemy are displayed in the distance.

THE SOUTH SIDE.

Portrait of Alderman Boydell, whole length, in his official robes. Sir W. Beechey.
Bust of Alderman Waithman.
Portrait of Lord Heathfield, half length. Sir J. Reynolds.
The Murder of David Rizzio. J. Opie.
Portrait of the Marquis Cornwallis. J. S. Copley.
Defence of Gibraltar, Sept. 14, 1782. Paton.
Relief of Gibraltar by Lord Howe. Paton.
Lord Rodney breaking the French Line on April 12, 1782. Dodd.

THE COURT OF EXCHEQUER.

A large historical picture, presented by His Majesty Louis Philippe to the city of London. It was painted by his Majesty's command, and represents his reception of the Lord Mayor, the Aldermen, Common Council, and the various civic dignitaries, on their presenting a congratulatory address to him when on a visit to Queen Victoria at Windsor Castle. A great number of portraits are introduced, for which purpose the painter, M. Alaux of Paris, came to London expressly to paint the picture.
Whole length Portraits of King George III. and Queen Charlotte. Ramsay.
Portraits of William III. and Queen Mary, his consort, whole lengths. Van der Voort.
A large picture of a Family, called Conjugal Affection. R. Westall, R.A.
Apollo washing his locks in the Castalian Fountain; and Minerva. Both by the same.

In the other courts are several portraits of deceased judges, by Wright. Ready admission to view these rooms and the pictures is given, on applying to the person in care of them.

The Courts of Common Pleas and the Queen's Bench.—In the entrance-hall are three paintings, which were formerly in the Church of St. Olave's, Jewry, representing King Charles I. at Prayers; Queen Elizabeth's Tomb; and Time on the Wing. On the walls in the Queen's Bench Court, are the portraits of—

Sir Robert Atkyns, Knt.
Sir William Ellys, Knt.
Sir John Vaughan, Knt.
Sir Francis North, Knt., afterwards Baron Guildford.
Sir John Archer, Knt.
Sir Timothy Littleton, Knt.
Sir Thomas Twisden, Knt. and Bart.
Sir John Kelynge, Knt.
Sir Matthew Hale, Knt.
Sir Edward Thurland, Knt.

In the Common Pleas Court are the portraits of—

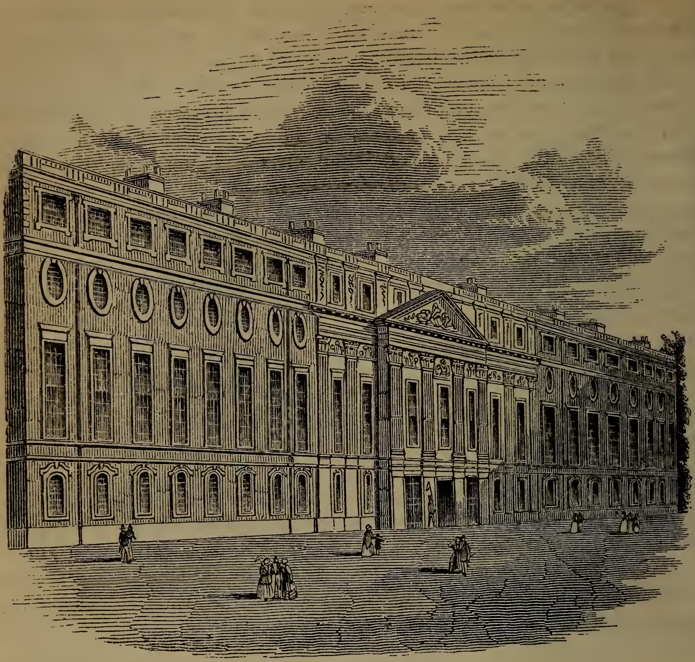
Sir Heneage Finch, Knt., afterwards Earl of Nottingham.
Sir Christopher Turnor, Knt.
Sir Edward Atkyns, Knt.
Sir Wadham Wyndham, Knt.
Sir Thomas Tyrrell, Knt.
Sir Samuel Browne, Knt.
Sir Edward Turnor, Knt.
Sir Orlando Bridgman, Knt. and Bart.

All these portraits were painted about the year 1671, in testimony of the city's gratitude to the persons represented, for their services in settling the properties of the citizens after the great fire in 1666. They are drawn in their robes at full length by Michael Wright, who received of the city 60*l.* for each portrait. Their arms are painted on the respective picture-frames.

HAMPTON COURT.

The Palace of Hampton Court is situated about twelve miles westward of London, on the north bank of the River Thames, in the county of Middlesex. A considerable portion of the present edifice was first raised by Cardinal Wolsey, in the reign of Henry VIII., as a residence for himself; but the king becoming jealous of its growing magnificence, the cardinal presented it to the sovereign, in the year 1526, and was in turn rewarded by the gift of the palace at Richmond, and with enormous manorial rights in the counties of Surrey and Middlesex. On the accession of William III. to the throne, he added many parts to the building, and completed it as it now exists. At present there are three spacious quadrangles contained within the palace, and a multitude of apartments. Many suites of rooms are occupied by private persons, by permission of the Crown, being mostly the reduced relatives of aristocratical families. The state apartments, and many other rooms, have been converted into a kind of public picture-gallery, which, with the beautiful gardens, have become a favourite resort of the industrious classes in the summer season and on holidays.

The palace is easily reached in less than three quarters of an hour by the South-western Railway, from the Waterloo Road, and is open



HAMPTON COURT PALACE.

to the public on every day of the week, including Sunday, excepting Friday, when it is closed for the purpose of cleaning the apartments. The hours are, from 10 o'clock in the morning until 6 o'clock in the evening, from the 1st of April to the 1st of October, and for the remainder of the year from 10 till 4. No fee or payment is permitted to be taken; but in the private garden there is a famous vine, and a maze, where the gardeners expect some small gratuity for showing them.

The total number of pictures contained in the series of rooms to which the public have access, is 1,027; comprising the ever-famous cartoons of Raffaelle, some other excellent pictures, a great number of portraits, and also a great number of utterly worthless pictures; the whole being the gathering from various royal residences, for which they were no longer adapted. It is to be regretted that the greater number of the insignificant part bear the names of renowned ancient masters, as they have no analogy in subject or execution to their immortal works, and are calculated not only to mislead the uninstructed, but to throw ridicule upon the knowledge of art in England in the eyes of foreigners who visit the palace.

A catalogue of 72 pages, containing a detailed description of the palace, and a numerical catalogue of the pictures, is sold by the attendants in the Guard Chamber, on entering, for 6*d.*, which makes it necessary only to notice the principal features of interest worth the attention of visitors.

The grand staircase is painted by Verrio: after ascending it, the first apartment is called the Guard Chamber. On the walls are a great number of military implements, ornamentally disposed, and some pictures. The succeeding room, called the King's First Presence Chamber, contains a number of female portraits, by Sir Godfrey Kneller. In King William's bed-room is the well-known series commonly called King Charles the Second's Beauties, being the portraits of the most beautiful ladies of his court; they are principally from the hand of Sir Peter Lely, and are 19 in number. After passing through a great many fine apartments, filled with pictures, the visitor arrives in a splendid room, constructed expressly to contain the celebrated cartoons of Raffaelle. As, by the unanimous consent of all the connoisseurs and artists who have ever lived, they are accounted the grandest and most important emanations of the human mind produced in the art of painting, they compensate amply for the disappointment experienced on viewing the multitude of pictures in the other rooms. Fortunately they stand alone in the apartment. Although the light is not the most favourable, and they are hung too high above the sight, the spectator, if at all versed in the higher qualities of fine art, will be gratified to the utmost extent. The subjects are—

The Death of Ananias.
Elymas the Sorcerer struck with Blindness.
The Miraculous Draught of Fishes.
Healing the Lame at the Beautiful Gate.
Paul and Barnabas at Lystra.
Paul Preaching at Athens.
Christ's Charge to Peter.

In a succeeding room are 9 pictures, painted in distemper, of the Triumph of Julius Cæsar, by Andrea Mantegna, for the Duke of Mantua; they were brought to England in the reign of Charles I., who purchased the entire collection for 80,000*l.* This series is much decayed, but is a magnificent work, and the most important existing of the master.

After viewing the pictures, the most interesting object is the great hall, 106 feet in length, 40 in width, and 60 in height. The timber roof, richly carved and gilt, is a remarkable monument of this kind of construction. The hall was begun to be erected by Cardinal Wolsey, but was completed by Henry VIII. Beyond the hall is another large chamber of similar style and epoch, called the Withdrawing Room. The tapestry, stained glass, and other decorations of these two halls are fully and well described in the catalogue sold in the palace.

The gardens (see also article "Gardens") are laid out in the formal French style of Le Nôtre, and being well kept, afford a very agreeable promenade. Immediately adjacent is another royal demesne of great extent, called Bushy Park, the principal feature of which is a broad avenue of horse-chestnut and lime trees, upwards of a mile in length. Altogether, a visit to Hampton Court, for its architectural varieties, some few fine pictures, particularly the cartoons, the palace gardens, and Bushy Park, makes an interesting day's engagement. There is, besides, no lack of accommodation at the various inns and places of refreshment, for every class, from those in the highest rank of life to the humble operative.

THE COLLECTION OF T. HOLFORD, ESQ.

The collection forming by this gentleman is temporarily placed in the house in Russell Square which was formerly occupied by Sir Thomas Lawrence. It already consists of about 120 pictures by the ancient masters, many of them being of first-rate celebrity. Mr. Holford is erecting a mansion on the site of Dorchester House, in Park Lane; and when it becomes ready for occupation, the pictures will be transferred to adorn the various apartments of his residence.

The front parlour of the house in Russell Square is entirely hung with portraits. The principal ones are, whole-lengths and life-size, of a Spanish General, by Velasquez; the Abbé Scaglia, and a Young Lady of Rank, by Vandyck; and a Gentleman in old Spanish costume, by Dosso Dossi. Several of the other fine portraits, mostly half-lengths, are admirable works, by Bellini, S. del Piombo, Titian, and Tintoretto. The back parlour contains two of the famous Caracci series, painted for the Giustiniani Palace (the third picture, by Annibal Caracci, being in the collection of Mr. Tomline, of Carlton Terrace). The pictures here are by Agostino and Ludovico Caracci. These three famous pictures came to England in the Duke of Lucca's collection, and not being purchased for the National Gallery, after some negotiation by the trustees, they were subsequently exhibited in most of the cities of the United Kingdom, before they were separated and passed into the hands of private gentlemen who knew how to appreciate these glorious works. The drawing-room, on the first floor, contains principally the Dutch and Flemish pictures; but there is a fine half-length of a Lady, by P. Veronese, and some exquisite small pictures by Murillo, Greuze, and others. In the Dutch school, the long View of Dort from the River, formerly in Lady Stuart's collection, and a large Hobbima, in perfect preservation and freshness of tint, rank as the great ornaments. There are also fine pictures by Teniers, Wouvermans, Paul Potter, C. Du Jardin, W. Vandevelde, and many other famous painters of this school. The lesser drawing-room is rich in Titian, Giorgione, Bonifazio, Fra Bartolomeo, Palma Vecchio, and more particularly a large picture of the Holy Family and Saints, by Andrea del Sarto, and a wonderfully superb picture, by Gaudenzio di Ferrara, of the Holy Family and St. John, which places this painter in the highest rank of art. In an inner room are—a celebrated Evening scene, by

Claude; a large Landscape, by N. Poussin; a smaller one, by Gaspar Poussin; a capital Sea piece, by Backhuyzen; and several of Rubens's exquisite sketches; two of them—the slight one for the Entry of Henry IV., in the Luxembourg series, and the other, of the Assumption of the Virgin, for the picture on the high altar of the Cathedral of Antwerp—are of the most masterly character.

Mr. Holford very liberally grants permission to view his collection, while the pictures remain in Russell Square, to any stranger recommended by artists or amateurs of known distinction.

THE COLLECTION OF H. T. HOPE, ESQ., M.P., PICCADILLY.

The pictures of the Dutch and Flemish masters here collected are of the very highest quality of art in these schools, and have the advantage of having been obtained by this gentleman's ancestors (bankers at Amsterdam) principally from the painters themselves, who have contributed their choicest works. The Dresden Gallery is alone comparable, the royal collection at the Hague being decidedly inferior. Mr. Hope has also many capital Italian pictures, and a remarkably fine selection of ancient Greek sculpture. Among the modern sculpture are the Jason of Thorwaldsen and the Venus of Canova; there is, besides, an extensive series of Magna Græcia ware, and other articles of taste and virtù. The following is a catalogue of the pictures, but as the mansion which is destined to contain them is not yet completed, and only a portion at present hung in the rooms, it is impossible to describe them in regular succession.

THE ITALIAN GALLERY.

Corregio. A Magdalen.
Claude. Landscape, with Waterfall.
N. Poussin. An historical subject.
Palma Vecchio. Venus and Cupid.
Gaspar Poussin. An Italian Landscape.
Corregio. Portrait of Cæsar Borgia; from the Orleans Gallery.
Albano. The Virgin appearing to Saint Justinian; from the same gallery.
Guercino. Christ bound.
Raffaelle. Portrait of Marc Antonio.
Spagnoletto. A Saint.
Schiavone. The Nativity.
Raffaelle. The Dancing Girl.
Romanelli. The Virgin and Child.
Domenichino. The Infant Christ.
Raffaelle. St. Michael vanquishing the Dragon.
Titian. Our Savour tempted; from the Orleans Gallery.
Guercino. Our Saviour appearing to Mary Magdalen. Angelica and Medora, life size.
Titian. The Holy Family and St. Catherine.
Agostino Caracci. The Holy Family.
Schidone. The same subject.
Domenichino. Christ bound.
Fra Bartolomeo. Saint Francis praying.
Tintoretto. The Holy Family.
Tomaso de San Friano. The Visitation, an altar piece.
Domenichino. Saint Sebastian.
Salvator Rosa. Martyrdom of a Saint.
Andrea del Sarto. Saint Sebastian.
Domenichino. Saint Cecilia.
Giorgione. Judith with the Head of Holofernes.
Paul Veronese. Wisdom accompanying Hercules; from the Orleans Gallery.
Guido. The Grecian Daughter. Hymen burning the Arrows of Cupid. The Adoration of the Shepherds.
Salvator Rosa. Mountainous Coast Scene.
Geminiani. Christ at Emmaus.
Guido. The Head of Lucretia. Bacchus and Ariadne.
Ludovico Caracci. The Magdalen.
Paul Veronese. Himself between Virtue and Vice; from the Orleans Gallery.
Guido. Head of the Saviour.

Vasari. The six Italian Poets; from the Orleans Gallery.
N. Poussin. Apollo and the Muses, life size.

DUTCH AND FLEMISH GALLERY.

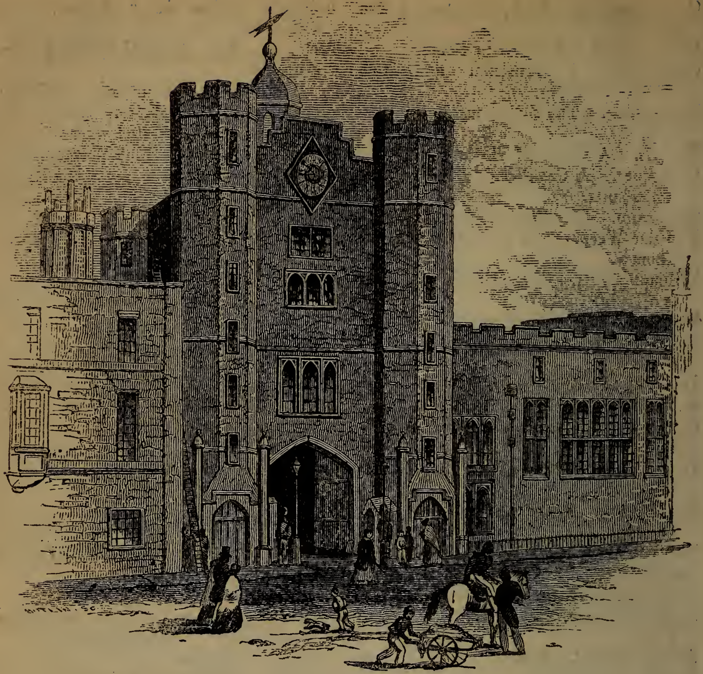
Vandyck. Charity, figures half length, life size. Ascension of the Virgin.
P. P. Rubens. A small Landscape.
Vandyck. The Virgin and Child.
J. Jordaens. Repast with Our Saviour. A composition of figures in conversation.
P. P. Rubens. The Death of Adonis, a large composition of life-size figures; from the Brandt collection.
Berkheyden. View in a Dutch City.
Van Os. Fruit on a Table.
J. Vanderheyden. Buildings in a City in Holland.
Jan Steen. The Repast, many figures.
Rembrandt. Portraits of a Lady and Gentleman.
William Mieris. The Temptation.
Vosterman. Landscape, Cottage Scenery.
J. and A. Both. Italian Landscape and Figures.
L. Backhuyzen. Sea Piece with Shipping.
Netscher. Lady at a Window with Parrot and Ape.
Jan Steen. The Repast, numerous figures.
N. Berghem. The Sybil's Temple and Falls of Tivoli.
Weenix. Dead Hare and Dogs.
G. Lairesse. The Death of Cleopatra.
William Mieris. A Woman selling Vegetables.
William Vandevelde. Small Sea Piece. A pair of similar subjects.
Lingelbach. Italian Market Place, with Figures.
William Mieris. A Woman selling Onions.
Weenix. Game Piece, with dead Stag and Birds.
E. Van der Neer. The Marriage.
B. Denner. The Head of an old Man.
William Mieris. Two Women playing with Dice.
Holbein. The Portrait of a Gentleman.
Van der Helst. A Halt of Travellers.
Ommeganck. Cattle in a Landscape.
G. Metzu. Figures, entitled Curiosity.
Van Huysum. Small classical Landscape.
Van der Neer. Figures in Conversation.
Paul Potter. Three Cows in a Landscape.
Rembrandt. Our Saviour in the Tempest.
C. Bega. An Interior, with Figures.
Breemberg. St. John preaching to the Multitude.
C. Dusart. Exterior of a Cottage, with many Figures.
Vanderheyden. A pair of Views in Dutch cities.
Van Huysum. Landscape, Italian Scenery. A similar subject.
Adrian Ostade. Exterior of a Cabaret.
Van Deelen. The Interior of a Church.
Cornelius Poelemberg. Adoration of the Magi.
Van der Werff. A Group of Figures.
Weenix. Dead Swans and a Peacock.
Terburgh. An Interior; the Music Lesson.
C. Du Jardin. A Garden Scene, with Cavaliers.
Terburgh. The Trumpeter.
Gerard Dow. Figures by Candle-light.
Van Tol. A Head, called the Usurer.
J. Van Huysum. A Bouquet of Flowers.
Slingelandt. A Woman at a Window.
Francis Mieris. An old Gentleman with a Violin.
Metzu. A Lady reading a Letter, a Servant waiting.
A. Vandevelde. An enclosed Pasture, with Cattle.
Backhuyzen. Large Marine View, with Vessels of War.
Metzu. The Student writing.
William Mieris. A Lady bargaining for a Fowl.
Adrian Ostade. Conversation at a Cottage Door.
J. Van Huysum. Fruit and Flowers.
William Mieris. A Gentleman offering Grapes to a Lady.
Schalken. A Man reading by Candle-light.
J. Ruysdael. Landscape, with Cattle and Figures.
Verkolie. A Lady bathing, with Attendants.
A. Vandevelde. Cattle watering, Evening.
P. de Hooge. An Interior, with Figures.
Weenix. Dead Swans, a Hare, and other objects.
Philip Vandyck. Two Ladies with a Parrot.

C. Poelemberg. A Nymph and a Sea Monster.
Van der Ulft. A View in Rome.
Ochterveld. A Musician and two Women drinking.
Berkheiden. The Stadthouse at Amsterdam.
Van Os. A Group of Flowers.
G. Coques. A Cavalier and Lady, with Attendants.
Schumann. The Connoisseur.
Van der Werff. The Incredulity of St. Thomas.
William Mieris. A Gentleman proposing to a Lady.
Van der Werff. The Magdalen reading.
Wynants. A Road traversing a barren Scene.
Paul Potter. Cattle in a Storm.
D. Teniers. Soldiers playing at Draughts.
G. Dow. Woman at a Window, with a Hare, &c.
D. Teniers. Soldiers in a Guard-room smoking.
Paul Potter. Exterior of a Stable, with Figures.
Van der Werff. Lot and his Daughters.
Van Tol. The Interior of a School.
Slingelandt. A Monk reading.
P. Wouvermans. The Halt of a Hunting Party.
Adrian Ostade. Figures outside a Cottage.
Hobbima. View in a Forest, with Cottages.
Terburgh. The General writing Despatches.
P. Wouvermans. Landscape, with Figures, and a Bagpiper. One of the painter's most celebrated works.
Metzu. A Lady in a Blue Velvet Tunic.
A. Cuyp. Cattle on the Banks of a River.
Gyssells. Dead Swan and many small Birds.
C. Du Jardin. Horses in a Landscape.
G. Flink. The Portrait of a Lady.
Berkheiden. A pair of Town Scenes.
Gyssells. A Kermesse, with a multitude of Figures.
Hugtenberg. A pair of Battle Pieces.
Ouwater. A View in Amsterdam.
A. Storck. A pair of Sea Pieces.
Berkheiden. Another pair of Town Scenes.
G. Flink. The Portrait of a Gentleman.
Breughel and Rottenhammer. An Allegory.
Griffier. View on the Rhine.
William Mieris. The Judgment of Paris.
Van der Ulft. The Old Town-hall of Amsterdam.
Verkolie. Jupiter and Saturn.
Berkheiden. Four Views at the Hague.
C. Poelemberg. Nymphs bathing.
Dubois. Damocles.
C. Lens. Bacchus and Ariadne.

The possessor of this remarkable gallery has usually favoured applicants, properly introduced, with a card of admission for a party on one day in each week of the months of May and June.

ST. JAMES'S PALACE.

In this edifice the Sovereign holds the Levees and Drawing Rooms. The first are attended by gentlemen only, and usually take place on appointed Wednesdays during what is termed "the season" in London. The "Drawing Rooms" are destined for the Royal reception of ladies as well as gentlemen, and are held on appointed Thursdays. The suite of apartments used for these purposes have windows looking into St. James' Park, and are of considerable dimensions. They may be said to be handsomely furnished, but fall very short of any regal magnificence worthy of the mighty kingdom of Great Britain. There were formerly some fine pictures by the great masters, and decorative furniture, but they have been removed since Her Majesty's accession, and they now contain only some good portraits with inferior ones and copies. On ascending the grand staircase, a guard chamber, adorned with a number of military arms in fanciful devices, is on the left hand. Passing through a similar one, usually decorated with arms,



ST. JAMES'S PALACE.

the first room of the state apartments is entered. This is called the Tapestry Room, as the walls are hung with this material; the antique fireplace still retains the initials of Henry VIII. and Ann Boleyn, interlaced with true lovers' knots. The Ball Room succeeds, and is the first grand apartment facing the park. Two large pictures of the Siege of Tournay and the Siege of Lisle by the Duke of Marlborough are hung in it; and there are likewise portraits of George I. and George II., Queen Anne, and some of the females called King Charles's Beauties, copies of those at Hampton Court. The next room in succession is the Drawing Room: it contains portraits of George III., the Prince of Wales, and the Duke of York, all by Sir Joshua Reynolds; and the Admirals Lord Nelson and Earl St. Vincent, painted by Hoppner. There are also here some of the female portraits above named. The Throne Room follows in succession. At the western end the Royal Chair of State is placed under a canopy emblazoned with the heraldic bearings of the Sovereign. On the walls are hung large pictures of the Battles of Vittoria and of Waterloo, by G. Jones, R.A.; whole-length portraits of George IV. and the Duke of York, by Sir Thomas Lawrence; a portrait of Charles II.;

and a picture of a young Lady returning from fishing. Immediately behind the Throne Room is a smaller apartment, called the Council Chamber. It contains two magnificent whole-length portraits, by Sir Joshua Reynolds, of Count La Lippe and the Marquis of Granby; a portrait of Lord Rodney, by Hoppner; and portraits of George II., Admiral Keppel, a German Prince, and George III.; the last by Sir Joshua Reynolds.

Returning to the guard room first entered, a long corridor, called the Entrée Gallery, contains the following whole-length portraits:—

Henry VIII., said to be by Holbein.
Queen Mary, daughter of Henry VIII.
Queen Elizabeth, by Zucchero.
King James I.
Charles I., copy after Vandyck.
Charles II.
James II.
William III. and Mary his Queen.

The state apartments are permitted to be viewed by strangers on application to the Lord Chamberlain, at his office in the Stable Yard.

The chapel royal connected with the state rooms is shown to strangers on application to the keeper. It has nothing remarkable in art but the highly-decorated ceiling, the design for which was from the hand of Hans Holbein.

H. A. J. MUNRO, ESQ., OF HAMILTON PLACE, PICCADILLY,

Is the collector of a great number of fine pictures of the ancient foreign, and of the modern English schools. In the latter portion are several of the finest landscapes and compositions of J. M. W. Turner, R.A.; also pictures by Richard Wilson, Bonington, Etty, and most of our celebrated artists. The ancient part comprises among the number the celebrated

Raffaelle. "La Vierge aux Candelabres." It was originally in the Borghese Palace, Rome, and afterwards in the collections of Lucien Bonaparte and the Duke of Lucca. There are numerous engravings of this singularly important and enchanting performance.

Raffaelle. The Holy Family, with St. John, engraved by Forster under the title of "La Vierge à la Legende." It was formerly in the gallery of Charles I.

Claude. A grand Landscape; from the Palazzo Spada.

Murillo. St. Anthony holding the Infant Saviour in his Arms; from the Royal Collection of Spain.

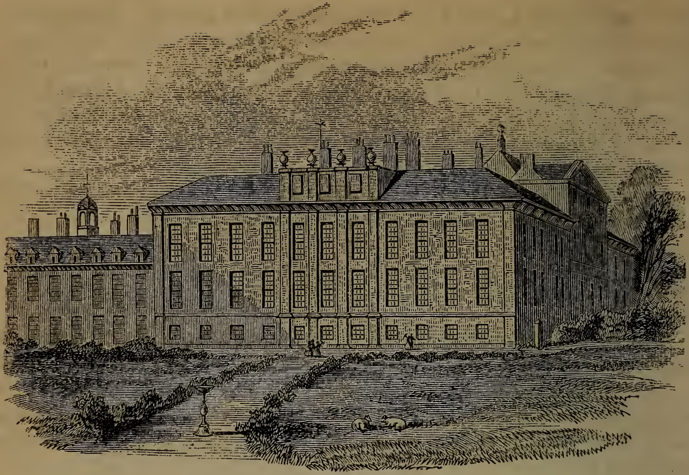
A. Watteau. Portraits of Two Young Ladies, known by the title of "Les Deux petites Marquises." A work of singular attraction.

Annibal Caracci. The Toilet of Venus; from the Tanari Palace at Bologna.

The above are but a few of the fine and numerous works composing this collection, which comprises a good specimen of most of the great painters of former times. The two pictures by Raffaelle alone give a standard of consequence to it, and it is here alone that Turner's great ability in landscape composition can be best estimated, about a dozen of his performances being hung on the walls.

KENSINGTON PALACE.

The collection of Byzantine, early Italian, German, and Flemish pictures, forming the collection of his Serene Highness Prince Louis D'Ottingen Wallerstein. This collection is of great interest, being the only one of a similar class in England. It is placed in the state



KENSINGTON PALACE.

apartments on the south side of the Palace, and occupies the rooms in which Her Present Majesty passed her youth. Admission is only obtained by Prince Albert's permission, for which purpose the keeper, Mr. Louis Gruner, No. 13, Fitzroy Square, may be addressed.

Nos. 1 to 9, and No. 26, are paintings of the Byzantine School, and comprise productions between the tenth and the thirteenth centuries. This portion elucidates the style adopted in the East by the early Christian painters. For their introduction into Western Europe we are indebted to Charlemagne and his successors, to presents made by the Greek Emperors to the Carlovingian kings, and to the Crusaders in the eleventh and twelfth centuries. These primitive works are exceedingly curious.

Nos. 10 to 25 consist of early Italian paintings, illustrating the first steps of art in Italy. Among these, Nos. 11 to 14 represent legends of St. Margaret, and have been, since the fourteenth century, on the altar of the private oratory of the Abbesses of St. Margaret, at Eichstadt. Nos. 15 to 23 comprise the pictures on a small altar-piece, with folding doors. The date 1367 is on the pedestal, and on the back is inscribed "Justus pinxit in archa." This is an elaborate work of singular merit for its antiquity.

MASTERS OF THE EARLY GERMAN SCHOOLS.

Nos. 27 to 30 are sacred subjects, by unknown masters. No. 31, also by an unknown master, representing the death of the Virgin, bears the date of 1417. No. 32, The Virgin and Child, also by an unknown master, is said to have been presented in the year 1327 by a certain Count Dillingen to the Chapter of Marie Madlingen, where it remained until 1802. No. 33 is a singular picture of the Trinity. No. 34, the Virgin and Child, by Heinrick Aldegrever. No. 35, the Martyrdom of St. Ursula and her Companions, by the same. Nos. 36 and 37, two pictures by artists unknown. No. 38, the Holy Family, with Saints, by Sigismund Holbein, uncle of the celebrated Hans Holbein; it formerly belonged to the Hohenzollern family. No. 39, Virgin and Child; school of Albert Durer. No. 40, the Daughter of Herodias, with the Head of St. John the Baptist; school of Lucas Cranach. No. 41, the Nativity, master unknown, signed G. B. No. 42, a Portrait, attributed to Martin Schaffner, dated 1530. No. 43, the Fall of Man, C. J. Beham, 1642.

THE RHENISH, FLEMISH, AND DUTCH SCHOOLS.

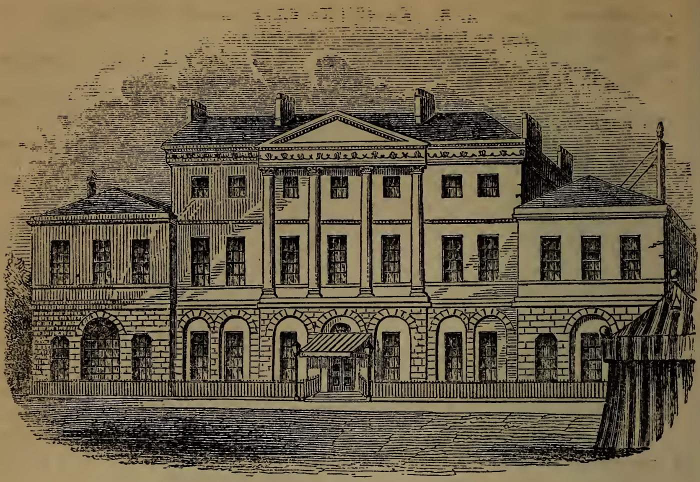
Nos. 44 to 47 are by unknown masters of the Rhenish and Flemish schools, who were influenced by the Byzantine art, and who lived previous to the time of Wilhelm of Cologne and the brothers Van Eyck. Nos. 48 and 49, subjects the Annunciation, were in an ancient church near Andernach, since the fourteenth century. This pair, and No. 50, The Virgin and Child, are by unknown masters of the school of Cologne, and imitative of Italian art of the fourteenth century.

BY WILHELM OF COLOGNE, THE VAN EYCKS, AND THEIR IMMEDIATE FOLLOWERS.

No. 51. St. Catherine of Alexandria, St. Matthew, and St. John the Evangelist. Wilhelm of Cologne.
No. 52. Ecce Homo. Hubert van Eyck.
No. 53. Virgin and Child. Jan van Eyck.
No. 54. Virgin and Child. Margaret van Eyck.
No. 55. A Pieta. Hugo van der Goes.
No. 56. Deposition from the Cross. Rogier van Bruges.
No. 57. Ecce Homo. By the same.
No. 58. Mater Dolorosa. By the same.
No. 59. Portrait of an Ecclesiastic. Hans Memling.
No. 60. Madonna and Child in a Landscape. Unknown.
Nos. 61, 62, and 63. Coronation of the Virgin. A tryptich by an unknown painter, probably Antonello da Messina. One of the most extraordinary and elaborate productions, of the highest interest as a specimen of the arts, painted in oil medium in its early development.

DUTCH MASTERS OF THE SIXTEENTH CENTURY.

No. 64. Presentation in the Temple. Israel van Mecheln.
No. 65. Portrait of a Maiden Lady. By the same.
No. 66. Virgin and Child. Cornelius Engelbrechtsen.
No. 67. St. Peter and St. Dorothea. Lucas van Leyden.
No. 68. Holy Family. Quentin Matsys.
No. 69. Judith. By the same.
No. 70. Portrait of a Female. Bernard van Orley.
No. 71. Mount Calvary. Jan van Mabuse.
No. 72. The Magdalen. By the same.
No. 73. Christ and Mary Magdalen. By the same.
No. 74. Holy Family near a Fountain. Jan von Schoreel.
No. 75. St. John in the Isle of Patmos. Joachim Patenier.
No. 76. St. Christopher. By the same.
No. 77. The Crucifixion. By the same.
No. 78. Virgin, Child, and Two Saints. Dierick Stuerbout.
No. 79. Virgin of the Rosary. Rogier van der Weyde.
No. 80. Adoration of the Magi. Jan van Heemsen.
Nos. 81, 82, and 83. Adoration of the Magi; a tryptich. Signed H. H., 1554.
No. 84. Adoration of the Infant Christ. Martin van Hemskerk.
No. 85. Portrait of Cosmo I. Antonio More.
Nos. 86, 87, and 88. Adoration of the Magi; a typtich. Henri de Bles.
No. 89. Portrait of a young Man. By the same.
No. 90. The Circumcision. Arnouldt Bogaert.
Nos. 91, 92, 93. Deposition from the Cross; a tryptich. Michael Coxcie.
No. 94. St. Francis receiving the Stigmata. Unknown.
No. 95. Adoration of the Magi. Idem.
No. 96. Virgin and Child. Idem.
No. 97. The Crucifixion. Idem.
No. 98. A Pieta. Idem.
No. 99. The Treachery of Judas. Signed A. T., 1601.
No. 100. The Archangel Gabriel. Unknown.
No. 101. A Girl writing. Idem.
No. 102. Virgin and Child. Idem.



RESIDENCE OF THE MARQUESS OF LANSDOWNE.

COLLECTION OF THE MARQUESS OF LANSDOWNE, BERKELEY SQUARE.

The mansion of this distinguished statesman, with the garden, occupies the entire southern side of Berkeley Square. It presents a long façade with a western aspect of great simplicity, and was built in 1765 by the brothers Adams, then the leading architects. All the apartments of reception are on the ground floor, and form a suite capable of receiving a larger number of guests than any other mansion in London. The collection of ancient sculpture dispersed therein is one of the finest private collections existing in England, including more life-size statues than are to be found in the British Museum. In all there are about 50 statues, as many busts, besides bassi rilievi, and other important specimens of ancient sculpture. The collection was originally formed by Gavin Hamilton, who first excavated the site of Adrian's Villa, which has subsequently enriched the British Museum, and added so many celebrated works to other galleries in Europe. On entering the mansion, a noble statue of Diana at the moment of launching an arrow, in active movement, stands at the foot of the staircase. In the great dining room, nine antique statues of divinities and heroes are placed in niches. Among the latter are Germanicus, Claudius, Trajan, and Cicero. There is also the Sleeping Nymph, a recumbent figure, being the last work of Canova.

The Front Drawing Room.—Here stands the statue of Venus quitting the bath, the most admired of all the works of Canova. This is a repetition by the artist of the same figure placed in the Tribune at Florence, in juxtaposition with the famed Venus de Medici. A statue of a child holding an alms-dish, by Rauch of Berlin, stands opposite, and over the fireplace the picture by Rembrandt — Portrait of himself, holding a palette, from the Danoot collection, Brussels.

THE DRAWING ROOM CONTAINS

Sir J. Reynolds. Portrait of the Countess of Berkeley.
Velasquez. Portrait of Pope Innocent X.
P. Della Vecchia. The wounded Soldier; four figures.
Greuze. Head of a young Female.
Guercino. Return of the Prodigal Son; from the Giustiniani Palace.
Murillo. The Virgin kneeling.
Rembrandt. Portrait of an elderly Female in a Ruff.
Schidone. The Virgin and Child.
Sir J. Reynolds. Portrait of Lady Anstruther: the Sleeping Girl.
Rembrandt. A.D. 1642. Portrait of a Lady; a picture of excessive beauty, formerly in the Julienne cabinet.
Velasquez. Charles V. when a Child, lying in his cradle.
Sir J. Reynolds. A Girl with a Muff.
Domenichino. St. Cecilia; from the Borghese Palace.
Schidone. The Virgin and Child. Fine as Corregio.
A. del Sarto. The Riposo; from Lord Radstock's collection.
Morales. The Head of a Female.
Velasquez. Portrait of the Duc d' Olivarez. Portrait of himself. These are from the Royal Palace of Madrid.
Venusti. The Holy Family and St. John.
Ludovico Caracci. Christ's Agony in the Garden.
Murillo. The Immaculate Conception of the Virgin.
Sir J. Reynolds. Head of a young Girl.

THE LIBRARY.

Sir Joshua Reynolds. Portrait of Kitty Fisher. The Portrait of Laurence Sterne. Portrait of a Lady in a black Cloak.
A. del Sarto. Portrait of himself.
Titian. Portrait of a Gentleman, holding a roll of paper.
J. Jackson, R.A. Portrait of Flaxman, the Sculptor.
Bernardino Luini. St. Barbara.
C. Jervas. Portrait of Alexander Pope.
Vandyck. Portrait of a Lady.
Rembrandt. Portrait of a Burgomaster.
Van der Helst. Portrait of a Gentleman.
Giorgione. Portrait of Sansovino, the Venetian architect.
Gainsborough. Portrait of Dr. Franklin.
Vandyck. Portrait of Queen Henrietta Maria.
A. Caracci. Head of an old Man.
S. del Piombo. Portrait of the Count Federigo di Bozzola; from the Ghizzi Palace, Naples.
Titian. The Magdalen; from the collections of Charles I., Queen Christina of Sweden, and the Orleans Gallery.

The numerous portraits and heads in the Marquess of Lansdowne's possession, both in London and at his seat in Wiltshire, are all works of the highest beauty. Perhaps there is no other collection in which the human countenance appears with such glorious attributes of mental expression and artistic execution.

The Grand Gallery is a superbly-decorated apartment, nearly 100 ft. in length. The principal portion of the ancient sculpture is placed here. Among the whole-length statues are those of Hercules, Marcus Aurelius, Mercury, Diomede, Theseus, Juno sitting, an Amazon, Juno standing, Hercules when a youth, Jason, &c. Two fine Egyptian statues of black marble, found at Tivoli, are placed on each side of the fireplace. Many other fine specimens in busts, rilievi, &c., are among the rarities in this splendid hall.

ANTE-ROOM.

J. Linnell. Portrait of Sir Humphrey Davy.
Sir A. W. Calcott. Landscape with Figures.
Eliza Baurnann. A Polish Family in Exile.

H. Raeburn. Portrait of Francis Horner, Esq.

Sir Thos. Lawrence. Portrait of the present Marquess of Lansdowne.

W. Severn. Italian Peasants.

Eckhardt. Sir Robert and Lady Walpole.

Sir A. W. Calcott. Portrait of a Lady.

Frank Stone. "True Love never did run smooth."

W. Simson. A Dutch Family.

C. R. Leslie, R.A. Sir Roger de Coverley going to Church.

THE STUDY.

F. P. Gerard. An emblematical Figure of Hope.

Gonzales Coques. Portraits of an Architect and his Wife.

Titian. The Head of Danäe; from the Orleans Gallery.

H. Stilke, of Dusseldorf. Joan of Arc praying and holding the Consecrated Banner.

Guido. The Head of St. Sebastian.

G. Poussin. Landscape, the Figures by N. Poussin.

Sir J. Reynolds, Life-size Portraits of Lady Ilchester, Lady Mary Cole, and Lady Elizabeth Fielding.

N. Poussin. Landscape, with Ruins and Figures.

A. Canaletti. View on the Grand Canal, Venice.

T. Von Holst. Portrait of a Lady.

J. Ruysdael. View of Amsterdam.

J. Both. Landscape, an Artist sketching from Nature.

Tintoretto. Portrait of a Cardinal.

J. Hackaert and A. Vandevelde. Interior of a Wood near the Hague, with Figures hunting.

Tintoretto. Portrait of Andrea Doria.

Isaac Ostade. A Winter Scene.

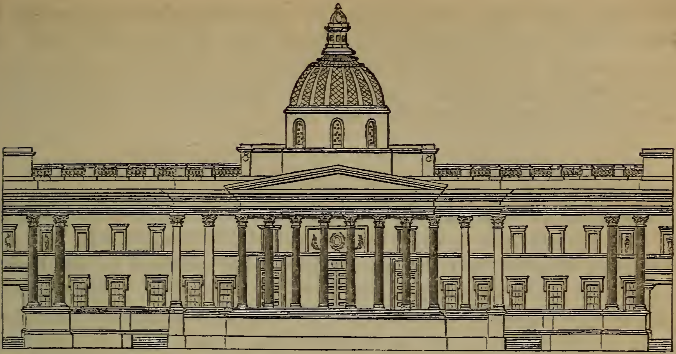
As all the preceding fine works are placed in the apartments in general use, it may easily be imagined that the collection is considered quite private. Admission to view it, however, is rarely refused to foreign artists of distinguished talent, or to persons who possess the advantage of introduction by personal friends of the noble possessor.

NATIONAL GALLERY.

The pictures forming this public collection are placed in the western wing of the building in Trafalgar Square. They consist entirely of what is termed the old masters—amounting in number to 175 only; amongst them, however, are many very capital works of the Italian School, and a few of the Dutch and Flemish School. So limited a number of pictures cannot fairly represent the great artists of past times; many of the highest fame not having a single specimen placed herein, and several are represented by very second-rate works. Nor is there much appearance of the national collection becoming worthy of England's greatness, from the apathy of the public authorities in acquiring really fine works when opportunities arise; three pictures only having been purchased by government during the last five years.

In the vestibule is placed a marble vase sculptured by Sir Richard Westmacott, R.A., from a colossal block of marble, taken at Paris, when entered by the British troops. The principal relief commemorates the battle of Waterloo. In the hall stands a statue of Sir D. Wilkie.

There are 8 pictures by Annibal Caracci; 3 by Ludovico Caracci; 10 by Claude, among which are some of his very finest works, including the famous ones painted for the Duc de Bouillon; by Cor-



THE NATIONAL GALLERY.

regio, 6: three of them—an Ecce Homo, Mercury instructing Cupid, and the Holy Family, called "La Vierge au Panier"—are renowned performances. By Domenichino, 4; by Francia, 2 capital pictures; by Guido, 8; by Murillo, 3; by Parmegiano, a celebrated picture called "the Vision of St. Jerome;" by Gaspar Poussin, 6; by Nicholas Poussin, 8; by Raffaelle, 4 secondary works; by Rembrandt, 8, including his chef-d'œuvre, the Woman taken in Adultery; by Rubens, 9, some of them excellent, particularly the Judgment of Paris, and the Peace and War; by Sebastian del Piombo, the great picture of the Resurrection of Lazarus, painted in jealous rivalry of Raffaelle's Transfiguration; by Titian, 5; by Vandyck, 4, one of which is the fine portrait of Gevartius; by Velasquez, 2; and by Paul Veronese 2. A catalogue is sold in the gallery for 4*d.*, and a descriptive and historical catalogue by R. N. Wornum, revised by C. L. Eastlake, Esq., R.A., may be purchased for 1*s.*

The gallery is open to the public, without any restriction, during Monday, Tuesday, Wednesday, and Thursday in every week. The other two days are reserved for the use of students. The gallery is closed during six weeks of the autumn season.

THE NATIONAL INSTITUTION, PORTLAND GALLERY, REGENT STREET.

This is a new association of artists which has sprung up within these three years, and if steadily maintained will be of great advantage to the numerous body. It was started on the principle of free exhibition, but the attendant expenses forbade the idea being further carried out than to give a few weeks of free admission at the close of the season. The greatest advantage the society offers is the privilege for themselves and other artists (not members) to exhibit their pictures favourably, by every one having a portion of what is called among them "the line," that is, the portion of wall opposite the spectator's eye. The gallery is commodious and well lighted: hitherto, the walls have been well occupied by interesting pictures in an exhibition which takes place in the spring, and is continued open for three months, at a fee of 1*s*. for admission. A novelty in the catalogue is that the price of every picture exhibited is printed therein for the information of purchasers.

THE DUKE OF NORTHUMBERLAND, CHARING CROSS.

The front of this mansion towards the street is a singular example of the seventeenth century; the central portion, which contains the gates opening into the quadrangle, being adorned in the fullest degree with the ornaments employed in this style. Every other part of the house is characterised by its great simplicity; it, however, contains many fine apartments and some excellent pictures. Among these will be found the well-known Cornaro Family, by Titian, a work well worthy of its reputation; by Guercino, St. Sebastian bound; G. Bassano, the Adoration of the Shepherds; Vandyck, a group of three portraits; Snyders, a Fox Hunt, and a Deer Hunt; G. Schalken, a Girl with a Candle, and some others. The great feature of Northumberland House is the ball room or grand gallery, in which are placed large and very fine copies, by Mengs, after Raffaelle's School of Athens, in the Vatican, of the size of the original; also, the Assembly of the Gods, and the Marriage of Cupid and Psyche, in the Farnesina; the Triumph of Bacchus and Ariadne, from Annibal Caracci's picture in the Farnese Palace; and Apollo driving the Chariot of the Sun, from the fresco, by Guido Reni, in the Villa Rospigliosi at Rome. The copies of these celebrated works, and the other decorations of this extensive apartment, constitute it one of the landmarks of high art in the metropolis; but admission to see it is unattainable, unless by a very powerful personal introduction.

LORD OVERSTONE, IN PARK LANE,

Has some rare specimens of the Dutch school, by its greatest masters; some of them are from the cabinet of Baron Verstolk van Soelen, at the Hague, which was bought entire, and principally shared by his lordship and Thomas Baring, Esq.

MR. SHEEPSHANKS, OF RUTLAND GATE, HYDE PARK,

Possesses an extensive collection of pictures by English artists, amounting to nearly 400 in number. It is in this gentleman's house that the peculiar beauties of the English school of painting can be best appreciated. The collection is peculiarly rich in the works of Mulready, Leslie, and Sir Edwin Landseer. Very ready permission to see the collection is accorded to applicants, upon recommendation by known artists or amateurs.

MR. JONES, LIVING IN THE CORRESPONDING HOUSE AT RUTLAND GATE, OPPOSITE MR. SHEEPSHANKS,

Has some fine pictures and sculptures. Among the former, he is the possessor of Danby's grand picture of the Deluge.

LORD GARVAGH, 26, PORTMAN SQUARE.

The only picture of consequence here is the one by Raffaelle, from the Aldobrandini Palace, at Rome, representing the Virgin Mary holding the infant Christ, who is presenting a pink to the youthful St. John. It is renowned as one of the most beautiful performances in England of this, the greatest of masters.

EARL DE GREY, 4, ST. JAMES'S SQUARE.

In this mansion there are several of Vandyck's very finest portraits, mostly whole-lengths; a picture, by Titian, of a young female holding a casket, commonly known as Titian's Daughter; a fine picture by Salvator Rosa; a pair of capital landscapes by Claude; and some few of the Dutch school.

EARL NORMANTON, 3, SEYMOUR PLACE, CURZON STREET,

Is the possessor of some important pictures by Holbein, a fine Holy Family by Parmegiano, and works of several of the living painters of the English school.

THE COLLECTION OF SIR ROBERT PEEL, BART., WHITEHALL GARDENS.

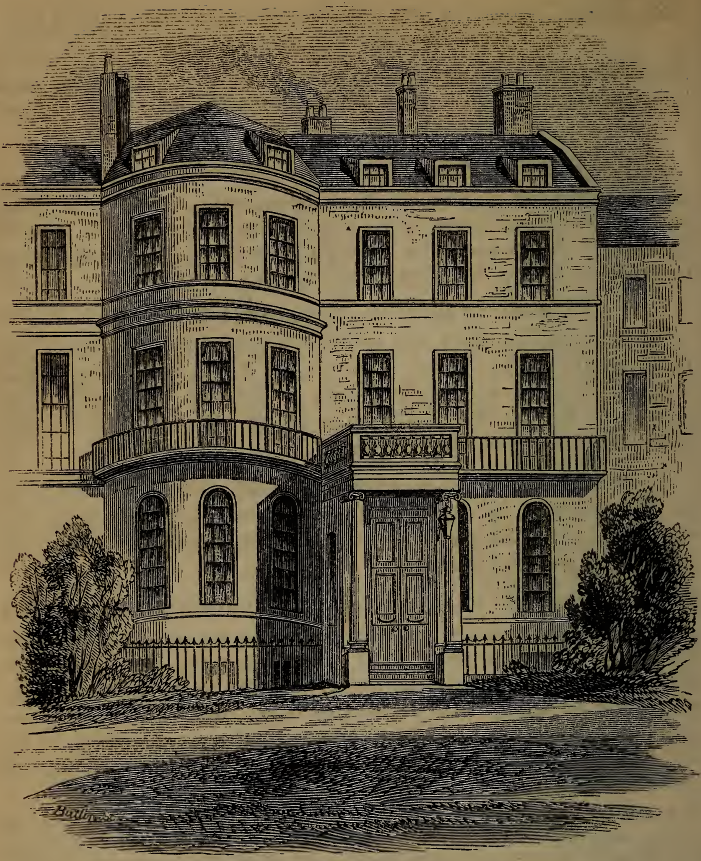
This collection almost entirely comprises the fine works of the Dutch and Flemish school. It was formed by the late Right Hon. Sir Robert Peel, and consists of examples of the highest excellence by the various masters, selected from all the royal and great galleries which have been either pillaged or dispersed by the revolutionary occurrences which have disturbed Europe during the past half-century.

P. P. Rubens. The "Chapeau de Paille." This truly wonderful picture is known to all connoisseurs by the repeated engravings which have been made from it, and from all the writers on art having extolled it as the perfection of colour. When it was brought to England in 1822, upwards of twenty thousand persons were admitted to view it on paying a shilling each. After this exhibition, it was purchased by the deceased Baronet for 3500*l.*, and now occupies the place of honour in the Gallery. Silenus, with Satyrs and other Figures: painted with the utmost luxury of colour, and appropriately placed in the dining room over the sideboard. This picture was purchased at the sale of Rubens's effects, after his decease, by the Cardinal de Richelieu, and afterwards passed into the Gallery of Lucien Bonaparte.

D. Teniers. "La Surprise facheuse;" an Interior. Four small Pictures representing the Four Seasons, each by a single figure. This esteemed series has successively adorned the cabinets of De Verrue, Le Prade, Blondel de Gagny, Gros, Nouri, Destouches, Le Brun, and Prince Talleyrand.

Gonzales. A Family Scene, with numerous portraits.

W. Vandevelde. A Light Breeze, with an approaching Storm. A Calm, 1661; a most brilliant picture, from the collection of the Duc de Berri.



RESIDENCE OF SIR ROBERT PEEL, BART.

G. Metzu. The Duet; from the collections of the Duc de Choiseul, Duc de Praslin, and Prince Talleyrand.

Hobbima. The Water Mill among woody scenery,

G. Netscher. The Soap Bubble. The finest work of the painter; formerly possessed by Raudon de Boisset, Poulain, Calonne, Le Brun, and the Duc de Berri.

William Mieris. A young Woman at a Window in conversation with a Gentleman.

P. Wouvermans. A Group of Figures in a barren place.

J. Ruysdael. A Waterfall; from the Brentano cabinet.

Adrian Vandevelde. Winter Amusements, with skating; from the collections of Mariette, Prince de Conti, and Count Pourtales.

Hobbima. A View in a Forest.

J. Wynants. Heath Scene, with Figures.

A. Vandevelde. Figures, and Cattle crossing a Brook; from the collections of Raudon de Boisset, Duc de Praslin, and Sir Simon Clarke.

W. Vandevelde. The Beach at Scheveling, figures by Adrian Vandevelde;

formerly in the cabinets of M. Schimmelpenninck, and Count Pourtales.

A. Cuyp. Cows drinking on the Banks of a River.

G. Netscher. Maternal Instruction; from the Orleans Gallery.

J. Van Ostade. Winter Scene on a Canal.

William Vandevelde, 1654. Calm at Sea.

F. Mieris. "Le Corsage Rouge;" from the cabinets of Gaignat, Duc de Praslin, and Mr. Beckford.

G. Metzu. The Music Lesson.

Sebastian Ricci. A Mythological Subject.

N. Berghem. Landscape, Ruins, and Cattle; from the Braancamp, Duc de Chabot, Tolozan, and Sir Simon Clarke's collections.

L. Backhuyzen. Sea-Shore; from the Lebrun Gallery.

Jan Steen. The Music Master; dated 1671.

G. Netscher. A Lady with a Distaff; from the collections of Blondel de Gagny, and Prince Galitzin.

P. Wouvermans. Interior of a Stable; from the collections of Count de Merle, and Watson Taylor, Esq.

D. Teniers. "Le mauvais Riche." The Torments of Wealth.

Wynants. Landscape, 1659; figures by Lingelbach.

P. Wouvermans. Halt of Officers; from the cabinets of Poulain, Count Dubarry, and Mr. Webb.

C. Du Jardin. Cattle reposing, 1658; from the collections of the Duc de Praslin, Robit, and Sir Simon Clarke.

Backhuyzen. The Mouth of the Thames, many vessels.

P. De Hooge. An Interior with Figures; formerly in the collections of Van Leyden and the Count Pourtales.

Paul Potter. Landscape and Cattle, dated 1654. One of his most exquisite works, and probably the last he ever painted, as he died early in this year. It has been possessed by Lindert de Neuville, Van Loquet, and Lord Gwydir.

Hobbima. The Avenue. A pure page of Nature of the most extraordinary truth, made out of common materials.

De Koningh. Extensive View over a flat Country.

G. Dow. The Dealer in Game. One of the most important works of this extraordinary painter; from the various collections of the Duc de Choiseul, Prince de Conti, Duc de Chabot, Dupré, and from Fonthill Abbey.

Terburg. The Music Lesson. How greatly this picture has been esteemed as one of the finest of this master, may be inferred from its having successively adorned the cabinets formed by Julienne, Prince de Conti, Marquis de L'ange, Duc de Praslin, Seréville, Prince Galitzin, and Mr. Barchard.

J. Van Ostade. Entrance to a Village, with many Figures; from the Choiseul Gallery.

Hackaert and N. Berghem. Stag Hunt in a Wood.

A. Vandevelde. Farm Buildings and Cattle.

P. de Hooge. Interior of a Paved Court, with Figures, 1658. True to Nature, almost to illusion.

Vander Heyden. View in Cologne, figures by A. Vandevelde.

P. Wouvermans. Coast Scene with Fishermen. The last piece painted by this great artist. It was commanded by Elizabeth, Queen of Spain, whose arms and the words "Elizabetha Regina" are placed on the back, but the painter unfortunately died a few days before the payment for it arrived.

Hobbima. Ruins of the Castle of Brederode.

A. Cuyp. Landscape, a ruined Castle standing in a Moat.

C. du Jardin. Cattle and Figures crossing a Brook.

A. Van Ostade. The Alchymist, 1661. A small picture of the rarest perfection; which may be imagined, as a dealer gave 800 guineas for it, before it was sold to the late Baronet.

A. Cuyp. A Dutch Pasture Scene with Cattle.

W. Vandevelde. A small Calm; from the Choiseul cabinet. A pair, being a Light Breeze and a Gale; both from the Count Pourtales' cabinet, and of first-rate excellence.

P. Wouvermans. A Landscape with an Ass.

C. du Jardin. Landscape and Figures; from Victor's cabinet.

P. Wouvermans. Barren Road with Figures.

Lingelbach. The Hay Season.

Moncheron. The Garden Scene, figures by A. Vandevelde.

Rembrandt. Portrait of a Gentleman.
Ruysdael. Grand Woody Landscape.
Sir David Wilkie, R.A. The famous picture of John Knox preaching before the Lords of the Congregation.
Sir Joshua Reynolds. The Snake in the Grass. Robinetta.

In the library are placed 18 original drawings by Rubens and Vandyck, from the collections of Sir Thomas Lawrence and others; all of the greatest consequence, and inconceivably fine.

The drawing-room is likewise adorned with the whole-length portraits of Her Majesty and His Royal Highness Prince Albert, painted by Winterhalter, and presented by Her Majesty to the late Baronet.

THE QUEEN'S GALLERY, BUCKINGHAM PALACE.

In an extensive corridor that occupies the centre of a long range of apartments on each side of it, the collection of pictures under this designation is placed. The gallery thus formed receives light from the roof; and on the walls are hung the Dutch and Flemish pictures collected by his Majesty George IV. His predilection was entirely for this school; and the rare and numerous specimens he acquired afford proof of a consummate judgment in this branch of art. The first acquisition made, was the purchase of all the Dutch and Flemish pictures belonging to Sir Francis Baring; others were continually added, under the advice of Lord Farnborough, as occasions offered. The gallery in the palace has just been re-decorated, and the following is a detailed list of the pictures which adorned it, and which are intended again to occupy the walls:—

Claude. Landscape, with Story of Europa; from the Ghigi Palace, Rome.
J. B. Greuze. "La Trompette," a Mother with Children in a Cottage, one of whom plays with a toy trumpet.
Le Nain. The Young Gamblers; from the Aldobrandini Palace.
Titian. A Woody Landscape, with Sheep and Figures.
A. Watteau. By this artist there are five pictures, four of which were painted for George I. when the painter came to England.
L. Backhuyzen. A Calm; from the cabinet of Count Pourtales.
N. Berghem. By this elegant painter there are six capital specimens, consisting of a Landscape with an expanse of country traversed by a river, dated 1655. The Rush Gatherers. A mountainous Landscape with figures. Two other Landscapes with figures, and a picture called "The Ford," dated 1650.
Jan Both. Philip baptising the Eunuch; from the cabinet of Smeth van Alpen.
A. Cuyp. There are no fewer than nine capital performances by this artist; among them is the celebrated picture of the Trooper. A Landscape, from the collection of Van Slingelandt. A Grey and a Brown Horse. A Gentleman and a Lady riding. Two Cavalry Soldiers. Ducks on a River. View on the River Dort, with a passage boat; and two Landscapes with Cows.
Gerard Dow. Eight pictures by this exquisite painter are in the collection, all of them remarkable for their marvellous execution. They comprise "La Ménagère;" from the Prince de Conti, Beaujou, and Geldermeester cabinets. A Girl chopping Onions; from the collections of Gaignat, Prince de Conti, Duc de Praslin, and Geldermeester. The Grocer's Shop; from the Choiseul Gallery. The Fruit Seller, from the same. A Woman at an Arched Window; in the Royal Collection since 1697. The Sick Chamber. An Interior, with a Mother nursing her Child, and a small Head of an old Man.

Karel Du Jardin. Landscape, a Hilly Country. Two Youths gambling, with other Figures. An exquisite picture of Cattle in a Meadow. Another picture of a similar subject, from the Choiseul collection; and an Italian Landscape with figures; a celebrated work from the various cabinets of the Count de Vence, Blondel de Gagny, and the Count de Merle.

G. Coques. A Family Group in a Landscape; from the collection of Lord Radstock.

Bernard Graet. Small Figures of the Family of the Burgomaster Six.

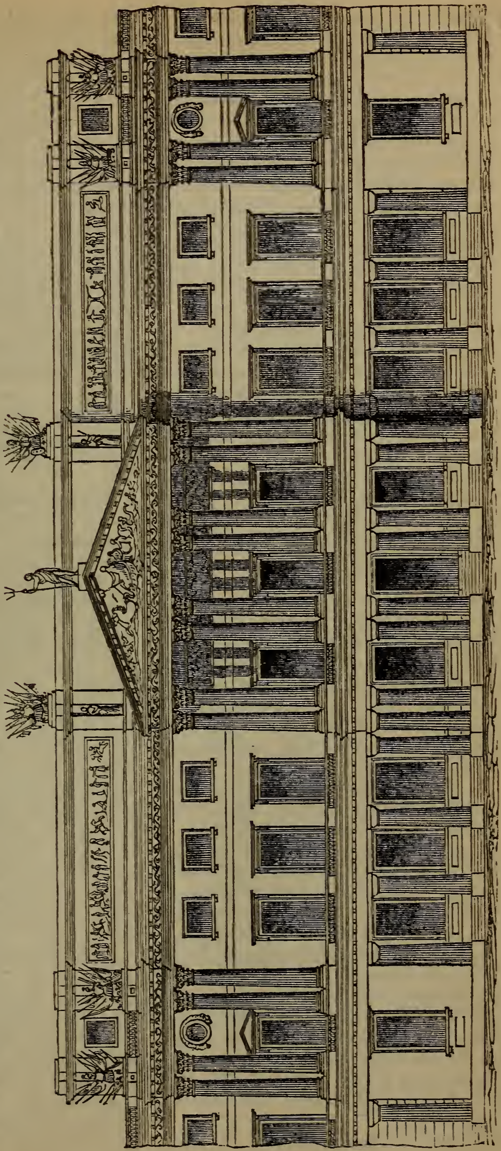
Frank Hals. Portrait of a Gentleman.

M. Hobbima. A Dutch Hamlet among Trees, and a small Woody Scene, with a Water Mill.

Peter de Hooge. The Card Party, from the collection of Count Pourtales; and the Court Yard of a House, with a Woman Spinning.

M. Hondekoeter. Live Fowls and a Dog in a Landscape.

Cornelius Janssen, Greenwich Palace in the time of Charles I., who is represented with his family promenading in the park.



BUCKINGHAM PALACE.

N. Maas. A Young Woman with her Finger on her Lip, descending cautiously a staircase.

G. Metzu. By this pleasing and esteemed painter six pictures belong to the royal collection. They are: A Young Girl selling Grapes. An Interior, with a Gentleman tuning a Violoncello near a Lady with a Music Book. The Portrait of Himself holding a Palette and Brushes. A Lady in a Crimson Corset holding a Guitar. A Girl at a Window holding a Bunch of Grapes; and the well-known picture called "Le Corset Bleu."

Jan Miel. An Italian Mountebank.

Francis Mieris. Four specimens of this painter's agreeable Pictures comprise a Boy at a Window blowing Bubbles; a Lady feeding a Parrot; a Gentleman smoking; and a Lady with a Spaniel in her Lap.

William Mieris. Three pictures:—the Fruiterer's Shop; a Dutch Family in humble Life; and an Interior with a Lady and Gentleman at Table, waited on by a Negro Servant.

Jan Molinaer. A Peasant Girl crossing a Brook.

C. Netscher. A pair of small Portraits of William III. when Prince of Orange, and of the Princess Mary his Wife.

A. Ostade. By this capital painter, the collection boasts of nine pictures. The subjects he chose are entirely from the humbler class, representative only of their daily habits. Five of these pictures are composed of Boors Drinking, Smoking, Eating, or Gambling. A sixth is a Dutch Family in a Cottage, dated 1668. A picture of Dutch Courtship, consisting of two Figures, another of a Peasant Woman, and an Interior with a Woman and Child seated, with two other figures, from the Geldermeester cabinet, complete the number.

Isaac Ostade. A capital picture of a Halt of Travellers by a Roadside Inn, from the Geldermeester cabinet; and a Rustic Family at a Cottage Door listening to a Man playing the Fiddle.

C. Poelemberg. Landscape with Ruins and Figures.

Paul Potter. There are four of the rare pictures of this great artist. A young Bull and two Cows in a Meadow, the Cattle of larger size than usual with this painter. Two Huntsmen on Horseback and other Figures halting at a Farm-House. Two Pigs lying down, from the Slingelandt cabinet; and a Landscape with a Stable and several Figures, from the celebrated collections of Lormier, Braancamp, Randon de Boisset, and Geldermeester.

Rembrandt. The performances by this great master in the collection are of first-rate beauty and importance. They are, Christ appearing to Mary Magdalen, formerly in the Hesse Cassel Gallery, whence it was abstracted by the French, and presented to the Empress Josephine, from whose palace of Malmaison it was sold in 1816. The Adoration of the Magi; the transparent gloom behind wonderful in execution. The Shipbuilder and his Wife. She is giving him a letter as he appears seated at a table; life-size figures seen to the knees; from the collection of Smeth van Alpen. The Burgomaster Pancras and his Wife, also life-size, seen to the knees; from the collection of Henry Hope, Esq. Half-length Portrait of a Lady standing at a Window. A Portrait of Himself, and the Portrait of a Jewish Rabbi, half-length.

P. P. Rubens. A grand picture, 9 feet high, and 12 feet in length, containing eleven full-length and life-size figures. It represents Pythagoras recommending temperance to his disciples; nymphs and fauns behind, and in front a profusion of fruit: this last is painted by Snyders. Formerly in the Royal Collection of Spain, and afterwards possessed by Joseph Bonaparte. A Landscape called "La Prairie de Lacken." This picture descended in the family with the Chapeau de Paille to M. Van Haveren, and was afterwards possessed by M. Aynard. The Assumption of the Virgin, a study for the great altar-piece in the cathedral at Antwerp; formerly in the collection of the Count d'Arcy, and Sir Simon Clarke. St. George and the Dragon, in a Landscape, which portrays the river Thames between Richmond and Windsor. It was painted by Rubens when he came to England,

and has been successively possessed by King Charles I. and the Duc de Richelieu, from whence it passed into the Orleans Gallery. Pan and Syrinx; from the collection of the Duc de Montesquieu. A Man with a Hawk, called "The Falconer," life-size, whole length. From the collections of the Duc de Praslin and M. Geldermeester. And the Family of Olden Barneveldt, a composition of seven figures, the principal one life-size, seated, and half-length, the others in the background, and a pair of allegorical female figures personating Time and History in front.

J. Ruysdael. Landscape, with a Cottage and Windmill, among bleaching grounds.

G. Schalken. Seven Figures at a Game of Forfeits. Formerly belonged to Louis XVI. A Musical Party, from M. Geldermeester's Cabinet; and a Lady with a Candle in her Hand, putting aside a Curtain, from the Le Brun Gallery.

P. van Slingelandt. A Lady, seated, making Lace, while a Child is asleep in a Cradle. From the Hesse Cassel Gallery, and afterwards possessed by the Empress Josephine, and Maximilian, King of Bavaria.

Jan Steen. An Interior, with an elegantly-dressed Female pulling on a Stocking: a Spaniel is by her side. An uncommon picture by this painter: it came from the collection of the Chevalier Verhulst. There are five other pictures, representing a Dutch Merry-making, a Dutch Revel, Twelfth Night, a Village Revel, and the Card Players; all of the painter's joyous and carousing scenes.

D. Teniers. By this universally known painter there are thirteen pictures, several of them from celebrated collections, and mostly of his most esteemed manner and period. A Village Fête, with thirty-one figures, dated 1645, from the Geldermeester collection. A similar subject, with fifty figures, dated 1649, from the Gallery of the Prince of Orange. A Village Fair, from the Poulain Cabinet. Interior of a Guard Room, called "Le Tambour Battant," from the Choiseul Gallery. Fishermen on the Sea Coast, from the Poulain Gallery. Teniers' Wife playing the Guitar, and Two Children, from the Orleans Gallery. The Interior of a Kitchen, an Old Woman peeling Turnips. A large Landscape and Farm-House, with Teniers and two Ladies talking to the Gardener. The Alchymist in his Laboratory. A pair of small Landscapes with Figures. A Village Fête, with thirty figures of larger size than usual. Another ditto with forty figures, and a small picture of four Boors playing at Cards.

G. Terburg. A Young Lady reading a Letter to her Mother, from the Geldermeester Cabinet; and a Lady and Gentleman drinking Wine.

J. Vanderheyden. Two pictures of Dutch Scenery, one House on the Banks of a River, the other Buildings in a Town, both with figures by Vandevelde.

Vandyck. The Marriage of St. Catherine, from the collection of the Chevalier de Burtin of Brussels; and Christ healing the Lame Man, formerly in the collections of Verhulst and Smeth van Alpen: both these pictures are superlative works of the painter. A Study of Three Cavaliers, and a Portrait of a Gentleman in Black.

A. Vander Meulen. Thirteen pictures, mostly of Combats or Views of Palaces in France, with figures of Court Personages.

Eglon Van der Neer. The Death of Cleopatra, from the Braancamp collection, and a Lady and Gentleman with Music, in a Landscape.

A. Van der Neer. An Evening Scene on the Banks of a Canal.

A. Vandevelde. A Hilly Landscape with Ruins and Cattle, dated 1659, from the Geldermeester Cabinet. Cattle at Pasture, dated 1664, from the same collection. Cattle in a Woody Landscape, from Smeth van Alpen's collection. The Sea-Shore at Schevening, dated 1660. A Dutch Dairy Farm, dated 1666. The Shepherd, in a Woody Landscape, watching his Flock, and a Hunting Party of Ladies and Gentlemen, mounted and on foot, in a bright sunny Landscape, dated 1666. These seven pictures are of exquisite beauty.

William Vandevelde. A Calm, from the cabinet of Smeth van Alpen; a similar subject from the Geldermeester collection, a Brisk Gale, with an agitated Sea; and a Breeze, are the subjects of the four fine pictures by the unrivalled painter of marine subjects.

Adrian Vander Werff. Roman Charity; two Children with a Guinea Pig; and Lot and his Daughters, are the subjects of this artist's three pictures in the collection. The last-named was formerly in the collections of the Duc de Choiseul, the Prince de Conti, and M. Calonne.

Philip Wouvermans. Nine pictures of this talented painter, comprising a Landscape with Figures on Horseback. A Horse Fair, rich in Figures, taken from the Hesse Cassel Gallery by the French, and presented to the Empress Josephine. A Halt of Cavalry before some Tents, called "Le Coup de Pistolet," from the Le Brun, Nogaret, and Tolozan collections. A Waggon attacked by Robbers, from the Le Brun and Geldermeester collections. A Hawking Party. The Hay Cart and Figures, from Smeth van Alpen's cabinet. A Horse Fair. The Farrier's Tent, and a Skirmish of Cavalry.

J. Weenix. A Hare and Dead Game.

J. Wynants. A Hilly Landscape with Figures of a Hunting Party by P. Wouvermans.

Sir Joshua Reynolds. The Death of Dido, three Figures of life size. Cymon and Iphigenia, also life-size figures, and considered the most beautiful and poetical composition of the master; and his own Portrait, wearing Spectacles.

Permission to view this extensive and choice collection is only granted by application to the Lord Chamberlain, at St. James's Palace. It may be readily understood that the favour is only conceded to persons of known respectability, or properly recommended; and the pictures can only be viewed when Her Majesty and the family are absent from the palace.

The private apartments contain a number of portraits of Her Majesty's ancestors and various members of the Royal Family, by Sir Godfrey Kneller, Sir Peter Lely, Allan Ramsay, N. Dance, J. S. Copley, Gainsborough, M. Wright, Sir Thomas Lawrence, Sir D. Wilkie, and others. In the State Drawing Room is a picture, by Vandyck, of Charles I., and his Queen presenting him a branch of laurel. There are also a few English pictures; among which a pair, by Zoffany, represent the Assembling of the Members of the Royal Academy, and the Interior of the Florentine Gallery; by Sir David Wilkie, His Majesty George IV. entering the Palace of Holyrood, and the well-known picture of Blind Man's Buff; by Sir William Allan, a picture called the Orphan Daughters; and the Duenna, by G. S. Newton.

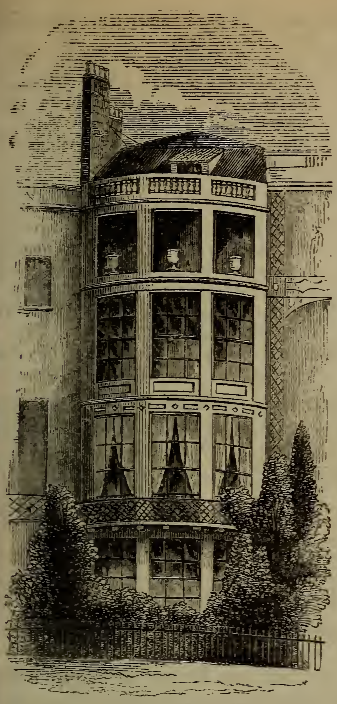
THE COLLECTION OF SAMUEL ROGERS, ESQ., F.R.S. AND F.S.A., NO. 22, ST. JAMES'S PLACE.

The house which contains this distinguished gentleman's collection is comparatively small; the interior is, nevertheless, overflowing with the choicest examples of fine art, the result of a long gathering, guided by infinite taste and learning. With the most liberal feeling for the enjoyment by others of these very select and rare performances, Mr. Rogers readily grants permission to view them, by the introduction of any known artist or connoisseur.

A. Sacchi. Christ bearing the Cross; formerly in the Orleans collection.

Mazzolina di Ferrara. Christ disputing with the Doctors; from the Aldobrandini Palace.

Titian. "Noli me tangere;" from the



RESIDENCE OF SAMUEL ROGERS, ESQ.

Orleans collection. Barry says of this picture, "The mellow and glorious union of landscape and history, of the Poussin size, is the completest I have seen, for all and every part."

A. Watteau. Two figures in a garden scene.

P. P. Rubens. A triumphal procession, a celebrated work, composed from part of Montegna's procession at Hampton Court, with additions by the great Flemish master. From the Balbi Palace.

Murillo. St. Joseph and the Infant Saviour; from Mr. Hope's collection.

Sir Joshua Reynolds. The renowned picture of Puck in Shakspere's Midsummer Night's Dream.

Rembrandt. An Allegory. Formerly Sir J. Reynolds's.

P. P. Rubens. Landscape, Moonlight. Idem.

A. del Sarto. Head of St. John; from the Mareschalchi Palace.

Sir J. Reynolds. The sleeping Girl.

Richard Wilson. Landscape, Evening.

Corregio. The Holy Family; from the Orleans Gallery.

Annibal Caracci. The Coronation of the Virgin; from the Aldobrandini Palace.

Giorgione. Small whole-length of a Knight in Armour.

Raffaelle. The Virgin and Child; from the Orleans Gallery.

Domenichino. Landscape. From the Borghese Palace.

Bassan. Lazarus and the rich Man.

Rembrandt. A Forest Scene, with Sunset Effect.

Sir Joshua Reynolds. The Strawberry Girl.

Gainsborough. Landscape, Morning.

Sir Joshua Reynolds. View from Richmond Hill.

Titian. The Apotheosis of the Emperor Charles V.

Gainsborough. A Landscape, with Cattle.

Leslie, R. A. Edward V. and his Brother in the Tower.

J. Van Eyck. Virgin and Child in a gothic niche. An extraordinary performance by this very early master.

Titian. Head of an elderly Man.

Sir J. Reynolds. Cupid and Psyche.

Memling. His own portrait, dated 1486.

B. R. Haydon. Napoleon on the Rock at St. Helena.

Holbein. Portrait of a Gentleman.

Canaletti. View in Venice.

Fra Angelico. Salome dancing before Herod.

Sir J. Reynolds. A Girl with a Bird in her Hand.

Rembrandt. His own Portrait.

Tintoretto. The Miracle of St. Mark.

Claude. Landscape, with the Piping Shepherd.

Ludovico Caracci. The Virgin and Child, with six Saints.

Raffaelle. Our Saviour on the Mount; from the Orleans Gallery.

Velasquez. The Prince of the Asturias, on Horseback.

N. Poussin. Landscape; the Campagna of Rome.

R. P. Bonington. The Turk reposing.

Cesare D'Arpino. A Warrior on Horseback.

Sir G. Beaumont. Conway Castle; figures by Wilkie.

P. P. Rubens. Landscape, a Woody Scene.

Giotto. The fragment of a fresco, containing the Heads of St. Peter and St. Paul; executed A.D. 1295.

Gaspar Poussin. A Landscape.

Domenichino. Landscape, with Apollo and Marsyas.

Baroccio. "La Madonna del Gatto;" from the Salviati Palace.

N. Poussin. The Adoration of the Shepherds.

Paul Veronese. Mary Magdalen anointing the Feet of our Saviour. A small repetition of the large one in the Durazzo Palace at Genoa.

Bassan. The good Samaritan. Formerly Sir J. Reynolds's.

Rubens. The Evils of War. The original study for the great picture of this subject at Florence. From the Balbi Palace.

T. Stothard, R.A. The Blessings of Peace.

Guido. The Head of our Saviour crowned with Thorns. Formerly possessed by B. West, P.R.A., and justly celebrated as one of the most sublime impersonations of the Divinity ever achieved by human talent.

Guercino. The Madonna and Child; from the Borghese Palace.

Lorenzo di Credi. Coronation of the Virgin.

The house also contains an extensive collection of Etruscan vases, some antique bronzes, sculptures, and a variety of lesser objects of art—all distinguished for rare excellence. In the library hangs, framed, the original agreement of Milton for the sale of his "Paradise Lost" to a publisher for the sum of five pounds, and duly signed by the immortal poet.

THE ROYAL ACADEMY

Was founded in the year 1768, by George III., and consists of forty members, entitled the Royal Academicians; twenty associates, from whom the members are chosen as vacancies occur; and six associate engravers. All official duties are fulfilled by the Academicians, who elect from among themselves, annually, the President; they also appoint a Secretary and Keeper, which offices are held for life. The affairs of the institution are managed by a council of eight members, besides the President, four of whom go out by rotation every year. They also elect among the body, Professors of Painting, Sculpture, and Architecture, and appoint a Professor of Anatomy, who must be a surgeon. Each of these professors delivers a course of lectures annually, to which the students, and all artists who have contributed works to the annual exhibition, are admitted. Schools are established, under the superintendence of visitors (who are always members of the Academy), for drawing from the plaster cast, the living model, and for the practice of painting: there is also an architectural class. All instruction is given to the pupils free of expense, the Academy being self-sustaining from the proceeds of an annual exhibition of the works of the members, associates, and other living artists of talent. It is the grandest display of the highest pictorial art in England, and usually opens the first week in the month of May and closes the last week in July. The Royal Academy possesses an extensive collection of casts from all the renowned works of antiquity, a considerable part of which was presented by George IV.

Every Academician upon his election is bound to present a specimen of his talent, consequently the Academy possesses a complete series of such works; many of them are, however, only secondary works. There are, besides a very celebrated copy of the Last Supper by Leonardo da Vinci, made by his pupil Marco Aggione, copies of the Descent from the Cross and the two Volets, by Rubens, made by Guy Head, and copies of the Cartoons of Raffaelle, by Sir James Thornhill. All these are of the size of the originals. There is also a very beautiful series of small copies, in oil, after the famous frescoes by Raffaelle, in the Vatican, and a few other useful and excellent copies of renowned works. The Academy also possesses an unfinished bas-relief of life-size figures, in marble, by Michael Angelo. It contains, in a circle, the Virgin with the Infant Saviour in her lap and St. John approaching, all of the highest beauty and dignity. This was presented to the Academy by the late Sir George Beaumont, who gave his pictures to the National Gallery. In the Library are two very fine cartoons, in excellent preservation, by L. da Vinci, the subject of one being the Holy Family and St. Anna, the other is that of the celebrated Leda.

THE SOCIETY OF ARTS IN THE ADELPHI.

This Society, which is of old standing, is composed of a number of gentlemen, either scientific, or desirous of encouraging science and art. By means of a small annual subscription from each of the numerous members, they give prizes and premiums for either novel inventions or meritorious works of art and design. In the year 1774, when they first occupied the building in the Adelphi where they now hold their meetings, they made a proposal to the living artists to execute a series of pictures for the decoration of the great room, offering for remuneration only the proceeds of an exhibition of these pictures when they should be completed. The artists were not stimulated to accept an offer presenting such uncertain prospects of recompense, until 1777, when James Barry, a member of the Royal Academy, undertook the onerous task. The pictures occupied him seven years, and when they were exhibited produced little more than 500*l*. The subjects are six in number, and fill the four walls completely. They are all 11½ ft. high; two of them are 42 ft. in length, and the other four are each 15 ft. long. The two great pictures represent the Procession of the Victors at the Olympic Games, and Elysium, or the State of Final Retribution. The four lesser subjects are—the Story of Orpheus; Navigation, or the Triumph of Commerce; a Grecian Harvest-Home; and the Distribution of Premiums by the Society of Arts. Another picture, by Barry, of Adam and Eve, is placed on the staircase; and a few minor works of art and ingenuity are always to be seen in the rooms. The public are usually admitted gratis to view the pictures, by applying personally every Wednesday. (See also article "Learned Societies.")

SOCIETIES OF PAINTERS IN WATER COLOURS.

The Old Society, as it is called, in this very fascinating region of fine art, originated in the year 1808, when its first exhibition of water-colour performances took place. A few years afterwards the annual display was removed to a more suitable situation and premises in Pall Mall, where it is open to the public early in the month of April, on the payment of 1*s*. The exhibition comprises usually about 500 various pieces, among which landscapes predominate. As this society limited the exhibition entirely to their own members, and a considerable increase of practitioners in this branch had taken place, the necessity of further facility for placing this class of art before the public became obvious. In 1832, a New Society of Painters in Water Colours was installed at No. 16, Old Bond Street, where its first exhibition was opened. This new society appealed to the public against the exclusiveness of its predecessor, and invited all other artists, not members, to assist with their contribution of pictures for the exhibition. The public sympathy and patronage was liberally accorded for presumed liberality; but no sooner had the new society become well established, than they adopted the same exclusiveness they complained of, and now allow only the works of their own society to be exhibited at their new premises in Pall Mall. The charge for admission here is also 1*s*.

THE COLLECTION OF HIS GRACE THE DUKE OF SUTHERLAND, STAFFORD HOUSE, ST. JAMES'S.

The principal feature of the pictorial embellishments of this mansion may be designated as of the Spanish school; although the examples of Italian, Dutch, and Flemish art, with some English pictures, are of first-rate excellence. The gorgeous decorations of the various apartments where these fine works are placed, and their being constantly occupied by the family, forbid the possibility of their being seen by any but by particular and intimate friends of the noble duke, or by those introduced by some distinguished personage. On the ground-floor, in the

GREEN LIBRARY.

Feuchères. A bronze statue, life size, of the present Marquis of Stafford in Highland Costume.

Sir Edward Landseer, R.A. Whole-length Portraits of Lady Mary Levison Gower, and the Marchioness of Stafford, with Dogs and a tame Fawn.

Guido. Atalanta and Hippomenes.

Watteau. A pair of Subjects of Ladies and Gentlemen enjoying rustic Festivities.

Rottenhammer and D. Seghers. The Holy Family, encircled by a Garland of Flowers.

D. Teniers. Landscape, with Ducks in a Pond.

A. E. Chalon, R.A. Portrait of the Duchess of Sutherland.

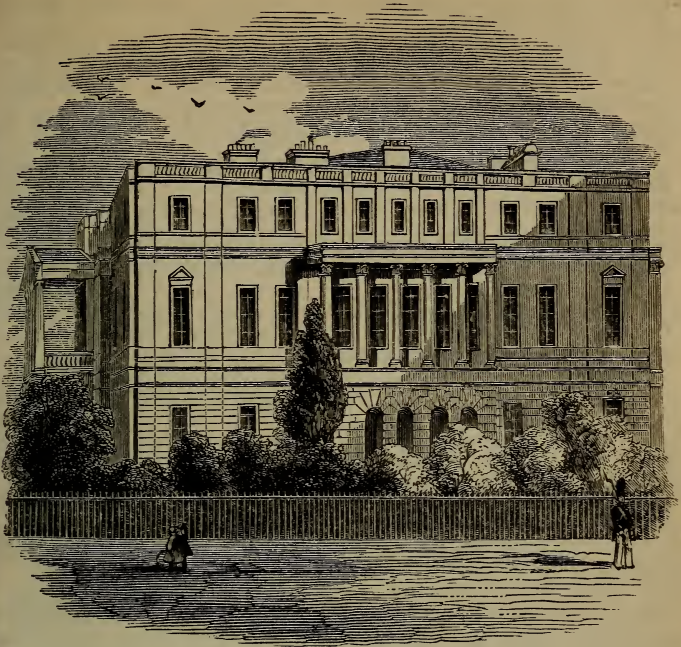
Winterhalter. Scene from the Decameron of Boccacio. The engraved picture.

A drawing of Flowers, by the Princess Adelaide of Orleans, presented to the Duchess.

ANTE-ROOM.

Guardi. A pair of Italian architectural Scenes.

Moucheron and A. Vandevelde. Landscape and Figures; from the collection of the Duchesse de Berri.



STAFFORD HOUSE.

A. Pynacker. Landscape; rom the same collection.

D. Teniers. A Medallion, decorated with Flowers, Fungi, and Fruits, inclosing an Incantation of Witches.

Hackaert and A. Vandevelde. Figures hunting in the Wood near the Hague.

Le Nain. A Piper playing to Children.

Velasquez. A Halt of Travellers.

Decker. View on a Canal, Figures by A. Ostade.

Lingelbach. Market Scene with Figures, outside an Italian city.

G. B. Weenix. Landscape, with Ruins of Buildings.

Guardi. Portico of the Ducal Palace, Venice.

De Heusch. Landscape on the Rhine.

J. Ruysdael. View over an Expanse of flat Country, with Figures by A. Vandevelde.

W. Romeyn. Landscape, with Figures and Cattle.

Wynants. A rustic Landscape, with Figures.

P. De Konnigh. Landscape, a vast Extent of Country.

Van der Meulen. A Combat of Cavalry.

Canaletti. View in Venice.

Jan Miel. A Priest bestowing Alms.

Orizonta. View in the Environs of Rome.

Tintoretto. The Pope seated, giving audience to Cardinals, Friars, and Attendants.

Eckhout. Cavaliers playing at Backgammon.

Claude. An Italian Landscape.

Breckelencamp. A Woman saying Grace.

S. di Ferrara. The Virgin, Child, and St. John.

Guardi. View of Venice, seen through an Arch.

DRAWING-ROOM.

Carlo Dolce. The Salvator Mundi.

J. Van Goyen. A River Scene, with

Figures. This is, without exception, the finest work of the artist.

Murillo. A Pair of half-lengths, life-size, of Saint Justina and Saint Rufina. Works of the highest excellence; they were painted for the Chapter House of the Cathedral of Seville.

G. B. Panini. A pair of architectural Subjects.

Raffaelle. Copy of the Madonna della Sedia.

G. B. Panini. The Marrriage of Cana, composed of a multitude of figures; from the Duc de Beni's Gallery.

P. P. Rubens. The Marriage of St. Catherine.

Artois. Grand Landscape, Woody Scene in Flanders.

ANTE-ROOM.

George Morland. Small Landscape.

Barker of Bath. An English Landscape.

George Morland. A Coast Scene.

Sir T. Lawrence. Portrait of Earl Clanwilliam.

W. Etty, R.A. Festival before the Flood; a superb composition of seventeen figures.

D. Wingfield. The Cartoon Gallery, Hampton Court.

Sir T. Lawrence. Portrait of the Marchioness of Westminster.

Sir A. W. Callcott. A Classical Landscape.

T. Stothard, R.A. Subject from the Spectator.

Sir George Beaumont. View of Conway Castle.

Sir David Wilkie. The Breakfast Table.

B. R. Haydn. Cassandra foretelling Hector's Death.

F. Danby, A.R.A. The Passage of the Red Sea by the Israelites. The pillar of light to guide their wanderings is a triumph of artistic skill.

THE DINING ROOM.

P. P. Rubens. A Group of Bacchanals.

Pietro della Vecchia. Soldiers reposing.

Sir Thomas Lawrence. Whole-length Portraits of the Duchess of Sutherland and Lady Elizabeth Leveson Gower.

Pordenone. The Woman taken in Adultery.

Bendemann. Lamentation of the Israelites in the Desert.

In the two corridors, which nearly traverse the mansion, on the ground-floor, there are many pictures by English artists, comprising —The Day after Chevy Chase, by T. Bird, R.A., and others by John Martin, B. R. Haydon, West, Allston, Westall, &c.; also a drawing, by Prince Albert, of his son, the Prince of Wales, which the Prince presented to the Duchess. From these corridors are entrances to the inner-hall, whence the grand staircase ascends to the state apartments. It fills the entire centre of the mass of building, and in loftiness occupies the total height, receiving abundant light from a range of lantern-windows, divided by the colossal caryatides which support the ceiling. Whatever wealth could obtain of skill and art to achieve the most magnificent *coup d'œil* in the metropolis, has been here lavished with consummate skill. The complete surface of the floor and staircase is covered with scarlet cloth; the balustrades of the hand-railing are of a graceful, complicated pattern, richly gilt. On the first landing is placed the marble statue of a sybil, by Rinaldi. From this landing two flights of steps diverge upwards to a gallery, which passes round three sides of the hall, and decorated with marble columns and balustrades. Copies, by Lorenzi, of several of Paul Veronese's colossal pictures fill various compartments. From the base to the ceiling of this grand architectural feature, sculpture, carving, gilding, and every ornament that could aid its magnificence, have been employed to complete it. The first apartment entered from the landing is the grand banqueting-hall. In a recess is placed the statue of Ganymede, by Thorwaldsen. A small ante-room leads to the gallery or ball-room, occupying the entire western side of the mansion; this apartment is unequalled for gorgeousness of decoration by any other in the palaces and mansions of England. The ceiling of the central portion contains Guercino's celebrated picture of St. Grisogono borne to Heaven by Angels; and in compartments on each side of the fire-place are two famous pictures, by Murillo, of the Prodigal Son's Return, and Abraham and the Angels, formerly in the Hospital de la Caridad, Seville, and obtained from thence by Marshal Soult, who sold them to the Duke of Sutherland for 12,000 guineas.

IN THE GALLERY.

Spagnoletto. Head of St. Peter,
Philippe de Champagne. Portrait of Colbert, the Minister of France under Louis XIV.
Titian. Portrait of a Gentleman.
Morone. A Portrait of a Gentleman.
F. Mole. St. John preaching in the Wilderness.
Gaspar Poussin. A Classical Landscape.
Andrea del Sarto. Holy Family and St. John.
Corregio. The Mule Driver. This little picture is reputed to have been painted for a tavern sign. It was in the collection of Queen Christina, and afterwards in the Orleans Gallery.
Paul Delaroche. Lord Strafford going to execution.
Guido. Head of a Magdalen.
Cignani. Virgin, Child, and St. Anthony of Padua.
Albert Durer. The Death of the Virgin.
Julio Clovio. The Holy Family, with a number of Saints.
Zurbaran. A Saint; from Marshal Soult's Gallery.
C. du Jardin. David with the Head of Goliath.
Zurbaran. The Nativity. St. Martin; from Marshal Soult's Gallery.
A. Caracci. The Martyrdom of St. Bartholomew; from the collection of Charles I.
Pellegrino da Modena. The Virgin enthroned, with Saints.
Murillo. St. Francis and the Infant Christ.
Raffaelle. Christ bearing his Cross; from the Ricciardi Palace.
Murillo. Head of a Peasant Girl; presented by Marshal Soult. Three small pictures of sacred Subjects.
Guercino. An Italian Landscape.
Annibal Caracci. St. Stephen with Angels. Christ blessing Little Children. The Riposo; from the Orleans Gallery.
Nicolo del Abate. The Rape of Proserpine.
C. Maratti. The Virgin teaching the Infant Christ to read.
Paul Veronese. Christ at Emmaus; from the Orleans Gallery.
Zurbaran. The Holy Family and St. John.
Ciro Ferri. The Virgin and Child.
G. Bassano. Presentation in the Temple; from the Orleans Gallery.
A. Veronese. Christ and the Woman of Samaria.
Spagnoletto. Christ and his Disciples at Emmaus.
Tintoretto. Portrait of an Old Man.
Zuccaro. The Transfiguration of the Saviour.
Alonzo Cano. God the Father, holding a Globe.
Tintoretto. Companion Portrait of an old Man.
Gennaro. A young Man reading.
N. Poussin. Nymphs and Satyrs.
P. P. Rubens. The Holy Family and St. Elizabeth.
G. Bassano. Noah and Family entering the Ark.
Guido. The Head of an elderly Female.
L. Spada. A young Man reading.
Cesare D'Arpino. Saint Michael.
Guido. The Circumcision in the Temple.
Zurbaran. St. Andrew. From Marshal Soult's Gallery.

Velasquez. Don Francis Borgia entering the Jesuits' College; several life-size figures; from Marshal Soult's.

Vandyck. Portrait of a Gentleman; extremely fine.

Titian. The Education of Cupid; after Corregio, but undoubtedly painted by Titian as a study; from the Braciano and Orleans collections.

Morone. The Portrait of a Jesuit, called also Titian's Schoolmaster. A wondrous and justly-extolled chef-d'œuvre of portrait painting; from the Borghese Palace.

School of the Caracci. Saint Margaret.

P. Subleyras. Portrait of Pope Benedict XIV.

Guercino. An Allegory of Saint Gregory.

Parmegianino. Portrait of a Gentleman; from the Aldobrandini Palace.

Paul Veronese. Composition, with a Nobleman praying.

Ludovico Caracci. The Holy Family.

Vandyck. Portrait ot the Earl of Arundel; from the Orleans Gallery.

Titian. Saint Jerome in the Desert.

Varotari. Jephthah's Daughter and her Companions.

Schiavone. The Entombment.

Murillo. Portrait of a Gentleman.

Domenichino. Saint Catherine of Alexandria.

L. Penni. Virgin and Child; from the Lucca Gallery.

Gerard della Notte. Christ before Pilate; figures of life size. Painted for Prince Giustiniani, and afterwards in the gallery of the Duke of Lucca.

L. Bassano. A Pastoral Fête.

Sasso Ferrati. The Virgin and Child.

Rubens. An Historical Sketch in "*grisaille.*"

Pourbas. Portrait of a Gentleman.

Titian. Portrait of a Cardinal. Portrait of a Cavalier.

A marble group of Cupid in a Bed of Roses, by Smith.

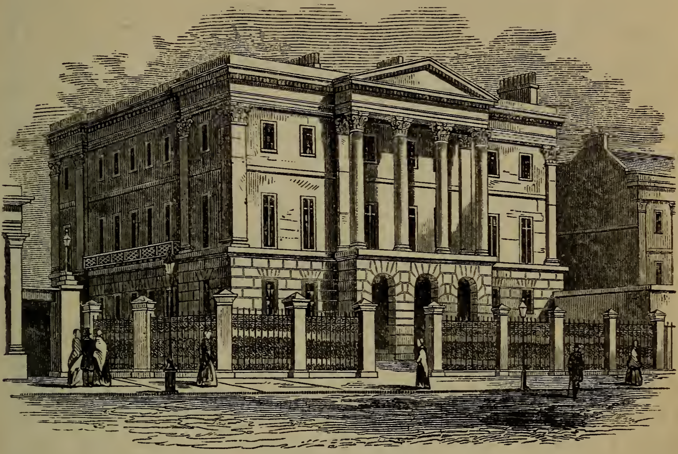
LORD WARD'S COLLECTION.

At present his lordship's pictures are placed in one of the galleries of the Egyptian Hall, Piccadilly, for the convenience of admitting his friends to view them advantageously. The collection numbers about 70 works, some of them of the highest character. It contains a large altar-piece of the Crucifixion, painted by Raffaelle in his earliest period, when he was studying under Perugino; and it bears such analogy to his master's hand, that if it were not inscribed with Raffaelle's name, and recorded in the history of the epoch, it would be so attributed. Another wonderful work is a composition of an immense number of figures of angels, cherubims, saints, holy and divine personages, by Angelico da Fiesole—admirable for grace and the religious fervour of expression. A three-quarters' length portrait of a lady, by Rembrandt, a matchless Canaletti, and two pictures by Guido, are among the greatest ornaments. In the early Italian school, an extraordinary picture, by Crivelli, formerly belonging to Mr. Coningham, and an altar-piece in three compartments, by the same painter, grace the collection, with other specimens of fine art worthy of the association.

THE MARQUIS OF HERTFORD'S COLLECTION.

This collection bids fair to surpass in importance any other forming at the present time, or even to equal any other pre-existing. It contains the rarest works that unbounded wealth could obtain during the few past years, from the galleries of Cardinal Fesch, the Saltmarshe collection, Lord Ashburnham, the late King of Holland, and many others. They remain unplaced until his lordship's new mansion in Piccadilly shall be completed to receive them.

THE DUKE OF WELLINGTON, APSLEY HOUSE, HYDE-PARK CORNER.



APSLEY HOUSE

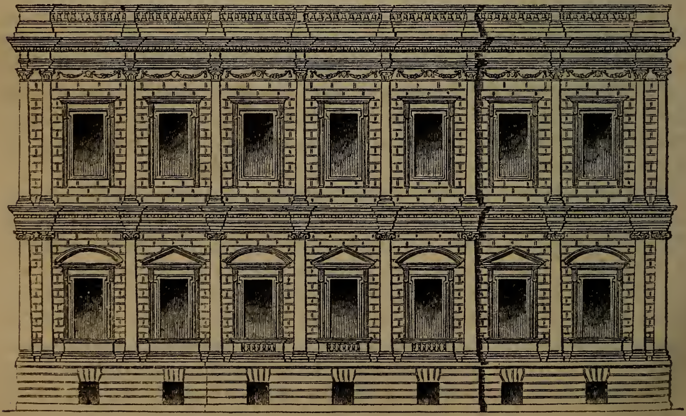
Many works of art of high importance decorate this mansion in the various apartments, the principal of which is a magnificent saloon, occupying the entire western side. On the walls are hung many of the finest pictures; and it is in this room the grand annual banquet is given by his Grace, on June 18, the anniversary of the Battle of Waterloo, to the principal officers of the army who fought on the occasion.

In the inner-hall stands the colossal statue of Napoleon, by Canova. The figure is nude, holding a winged Victory in the right hand. On the entrance of the allied armies into Paris, after the battle of Waterloo, it became a trophy of war, and was presented by the congregated sovereigns of Europe to the illustrious hero in whose mansion it is now placed. There is also a bronze copy of the monument, by Rauch, at Berlin, dedicated to the veteran Blucher.

The collection of pictures is not extensive, but exceedingly choice; several of them were presented to the Duke by the King of Spain, after their recovery from the baggage of Joseph Bonaparte, captured at Vittoria. The greatest gem is considered to be Christ's Agony in the Garden, by Corregio. It is a small picture, which has always borne the highest reputation, and was for a long time in the Royal Palace of Madrid. A similar subject, long attributed to Corregio, but now believed to be an old copy, is in the National Gallery. By Velasquez, there is the famous picture of the Water Seller, also from the royal collection of Spain; besides his own portrait, and the portrait of Pope Innocent X. A capital picture by Spagnoletto, called the Witch; the Adoration of the Shepherds, Lorenzo di Credi; and the Annunciation, a composition of Michael Angelo. After the battle of Waterloo, his Grace acquired from Monsieur Bonnemaison admirable copies which the artist had made from the four celebrated pictures by Raffaelle, belonging to the Spanish Government. The subjects are well known by the titles of the Spasimo, La Madonna del Pesce, the Pearl, and the Visitation. There is here also a repetition of the Madonna della Ledia of Raffaelle, by his pupil, Julio Romano. In the other schools of ancient art, are works by Claude, Vandyck, several by Jan Steen; the Peace of Munster, by Terburg; a composition of 80 figures, from Prince Talleyrand's cabinet; and specimens by D. Teniers, A. Ostade, P. Wouvermans, J. Van der Heyden, P. de Hooge, and other celebrated painters. By English artists there are the well-known picture, painted for the Duke by Sir David Wilkie, representing Chelsea Pensioners reading the Gazette of the Battle of Waterloo. The Battle of Waterloo, by Sir William Allan, R.A. By Sir Edwin Landseer, two pictures—one portraying a Highland Family, and the other, Van Amburgh, the Lion Tamer, in the cage with the wild beasts; and also, by Sir David Wilkie, a whole-length portrait of George IV., in Highland costume; William IV., whole length, in a naval uniform; and the bust only of Lady Lyndhurst. The collection is strictly private, and can only be viewed by especial permission, which is very difficult to be obtained.

WHITEHALL CHAPEL.

The ceiling of this chapel, formerly the banqueting house, was painted by Rubens, at the command of Charles I., in 1630. It consists of nine compartments, each of which contains a picture alluding to the prosperity and reign of James I. The central compartment,



BANQUETING HOUSE, WHITEHALL.

which is of oval form, represents the king seated on clouds, with his feet resting on a globe, grouped with various allegorical figures; this is usually called the Apotheosis of James I. A second central compartment exhibits the king seated on his throne, habited in the royal robes, and attended by figures emblematical of the happiness of his reign in banishing discord and the evils of war. The third grand picture has also the king enthroned, extending his sceptre towards an infant, afterwards Charles I., borne by female figures personifying Scotland and Ireland, and attended by Britannia. On each side of the central picture are friezes composed of numerous genii, angels and savage animals led by them, with abundance of fruit and sheaves of corn, portraying the good government of the king's reign. The four small compartments are occupied by emblematical groups of Wealth and Honour, Strength, Wisdom, and Justice.

Rubens was paid 3000*l.* for painting the series. They were taken down 15 years ago, and found to be in perfect preservation, and of the most refined execution of this great master. They had undergone, at various times, attempts at restoration, but these daubings were removed with the greatest facility, and the pure tints of the artist discovered beneath, uninjured and in their full perfection.

WINDSOR CASTLE.

Her Majesty has graciously commanded that the suite of state apartments in this noble pile of building should be open to the public, without expense, under the following arrangement.

Tickets to admit a party of four or six persons are issued by the Lord Chamberlain, and may be obtained, gratis, on application to Messrs. P. and D. Colnaghi, Printsellers, 14, Pall Mall East; Mr. Moon, Printseller, 20, Threadneedle Street; Mr. Mitchell, Bookseller, 33, Old Bond Street; Messrs. Ackermann, Printsellers, 96, Strand; Mr. Wright, Bookseller, 60, Pall Mall.

The tickets are available for one week from the day they are issued. The party applying for them as above is required to give his or her name, which is inserted on the tickets. They are not transferable, and it is contrary to Her Majesty's command if payment for, or in reference to, them be made to any person whatsoever.

The days for the public to be admitted by this means are Mondays, Tuesdays, Thursdays, and Fridays. The hours are—from the 1st of April to the 1st of October, between eleven and four; and from the 1st of November to the 31st of March, between eleven and three.

A small guide book, price one penny, printed by command of His Royal Highness Prince Albert, may be purchased at all the above named shops, where the tickets are issued. More extensive descriptions of the castle, and of the parks and forest are to be purchased of the booksellers in the town of Windsor.

The suite of state apartments to which the public have free admission, consists of the Queen's Audience Chamber, the Old Ball Room, the Queen's State Drawing Room, the State Ante Room, the Grand Vestibule, the Waterloo Chamber, the Presence Chamber, St. George's Hall, the Guard Chamber, the Queen's Presence Chamber.

The portion of the castle occupied as a residence by Her Majesty can only be viewed by an express permission of the Lord Chamberlain, to be obtained on application to him at the office in St. James's Palace. These permissions are only granted upon reference to some known person of respectability, and, of course, are only available when Her Majesty is resident elsewhere. The state apartments above enumerated are open to the public, whether Her Majesty is in the castle or not. The access to them is by an entrance under a small Gothic porch adjoining King John's Tower. Passing up a small staircase and through an ante-room, the first of the state apartments is the Queen's audience chamber. The ceiling is painted by Verrio, and the walls are embellished with tapestry, representing events from the book of Esther. Over a door is a whole-length of Mary Queen of Scots, by a painter unknown, in a frame exquisitely carved by Grinlin Gibbons; and, similarly placed, a whole-length portrait of William II., Prince of Orange, by Gerard Houthorst. The succeeding apartment, called

The Ball Room, contains the following pictures, painted by Vandyck.

1. Henry Count de Berg, half length in armour.
2. King Charles I. and his Queen Henrietta Maria, whole-lengths, life-size, sitting.
3. Mary, Duchess of Richmond, as St. Agnes, full length.
4. Thomas Killigrew, and Thomas Carew, three-quarter length.
5. Henrietta Maria, Queen Consort of Charles I., three-quarter length.
6. Venetian Lady Digby, whole length, sitting, with emblems repelling the calumnies of the day against her chastity.
7. The Duke of Buckingham and his brother, Lord Francis Villiers. Youths, full length.
8. The Prince of Carignan, in armour, three-quarter length.
9. The Queen of Charles I. A Profile, half length.
10. The Princess de Cantecroy, whole-length.
11. Children of Charles I., five figures, full-length.
12. King Charles I. Front, profile and three-quarter face. This picture was painted expressly by Vandyck for the sculptor Bernini, to make the king's bust from, and remained in Italy until George IV. purchased it for 1000 guineas.
13. The Queen of Charles I., half-length, in white satin.
14. Lucy, Countess of Carlisle, whole. length.
15. Sir Kenelm Digby, three-quarter length, sitting.
16. King Charles II. when a boy, whole-length.
17. Sir Anthony Vandyck, half-length.
18. Henrietta Maria, Consort of Charles I., whole length.
19. Three Children of Charles I., whole length.
20. The Countess of Dorset, whole length.
21. King Charles I. on Horseback, accompanied by his equerry M. de St. Antoine on Foot, life-size figures.
22. Portrait of a Gentleman.

Besides this fine and extensive gathering of the works of this eminent artist, the room contains some bronzes, from the antique.

The Queen's State Drawing Room. The ceiling is painted by Verrio, and there are nine pictures by Zuccarelli in the room, besides the portraits of Henry, Duke of Gloucester, George I., George II., George III., and Frederick Prince of Wales. Passing through the state ante-room, the grand staircase succeeds; on the landing-place is a colossal statue of King George IV., by Sir Francis Chantrey; here, crossing the grand vestibule, which contains some ancient armour, the Waterloo chamber is entered. It is a recently-erected room of large dimensions, and is adorned with the celebrated collection of portraits of the sovereigns, warriors, and diplomatists, who were distinguished in the great political events of 1813, 1814, and 1815. The portraits are all painted by Sir Thomas Lawrence, unless otherwise expressed, and are as follows:—

1. The Duc de Richelieu, Minister of Foreign Affairs in 1815.
2. General Overoff.
3. The Duke of Cambridge.
4. The Earl of Liverpool.
5. King William IV., by Sir D. Wilkie.
6. King George III., by Sir W. Beechey.
7. King George IV., whole-length, in the Robes of the Garter.
8. Lord Viscount Castlereagh.
9. The Duke of York.
10. Baron Von Humboldt.
11. The Right Hon. George Canning.
12. The Earl of Bathurst.
13. Count Munster.
14. Cardinal Gonsalvi.
15. The Prince of Hardenberg.
16. Frederick William III., King of Prussia.
17. Francis I., Emperor of Austria.
18. Alexander I., Emperor of Russia.
19. Count Nesselrode.
20. The Pope Pius VII.
21. Count of Capo d'Istria.
22. Prince Metternich.
23. Viscount Hill, by *Pickersgill*, R.A.
24. Charles X. King of France.
25. Prince of Schwartzenberg.
26. The Archduke Charles of Austria.
27. Lieut.-General Sir Thomas Picton.
28. The Duc d'Angoulême.
29. The Duke of Brunswick.
30. Leopold, King of the Belgians.
31. General Sir James Kemp, by *Pickersgill*, R.A.
32. The Hettman, Count Platoff.
33. The Duke of Wellington.
34. Marshal Blucher.
35. Count Alten, by *Reichmann*.
36. The Marquis of Anglesey.
37. Count Czernitscheff.
38. William II., King of Holland.

The next apartment, called the Presence Chamber, is decorated with tapestry, and contains on a pedestal a magnificent malachite vase, presented to Her Majesty by the Emperor of Russia. This room leads to

St. George's Hall, an apartment 200 ft. long, 34 broad, and 32 ft. high. The decorations have all of them allusion to the order of the garter, and there are portraits of the sovereigns of England from James I. to George IV. The state banquets take place occasionally in this vast apartment.

The Guard Chamber contains a variety of arms and military trophies. In a glass case over the fireplace is the shield presented by Francis I. to Henry VIII., at the meeting on the field of the Cloth of Gold, near Calais. The workmanship of it has been attributed to Benvenuto Cellini. There are the busts of Wellington by Chantrey, the Duke of Marlborough, by Sievier, after Rysbrach, and of Nelson also, by Chantrey, in this room.

The Queen's Presence Chamber concludes the suite of state apartments; the walls are hung with tapestry, and the portraits of the Princess Elizabeth of Brunswick, and the Princess Dorothea of Brunswick, both painted by Mytens the elder, and a portrait by Mignard of Henrietta Maria, daughter of Charles I., afterwards Duchess of Orleans.

Leaving this part of the Castle, the visitor's attention is called to an enormous building, known as the Round Tower; the ascent to the top is by a hundred steps, and the view from the summit embraces a vast extent of country, including Windsor's renowned park. The chapel, called St. George's Chapel, is also deserving of a view. In it the installation of the knights of the garter takes place, and their insignia are placed over the stalls. There is a monument to the memory of the Princess Charlotte, consisting of several figures, in very questionable taste; some early paintings in the recesses at the back of the stalls, and at the upper end of the chapel, near the altar, some curious early iron-work, conjectured to have been executed by Quintin Matsys, the blacksmith of Antwerp. Adjoining St. George's Chapel is the tomb house, and the opening into the vault containing the mortal remains of many members of the present Royal Family. Visitors are also invited to view the royal stables. For viewing the stables, the round tower, and St. George's Chapel, the attendants expect a small gratuity.

The town of Windsor possesses no interest. By the Great Western and the South Western railways, trains convey travellers several times in the day, the rapid journey enabling them to view the Castle, and, if desirable, to take a drive to Virginia Water, or to visit Herne's Oak, immortalized by Shakspeare in the Comedy of "The Merry Wives of Windsor." (See article "Gardens," &c.)

LONDON UNIVERSITY COLLEGE.

The new works in University College were finished by the beginning of 1851, and include the Flaxman Hall, and adjoining apartments and the Library. The Flaxman Hall is the central apartment under the Cupola, and was designed by Professors Cockerell and Donaldson for the reception of Flaxman's models, presented by Miss Denman. This hall is a fitting memorial of the great English sculptor, and its architectural details are richly decorated. In the vestibule is a large group, Flaxman's restoration of the torso of the Hercules Farnese. Under the dome is his St. Michael and Satan, and around the walls of the hall are his various monumental and other bas-reliefs, arranged in compartments. An adjoining room contains the Shield of Achilles and other works. The library, designed by Professor Donaldson, is a large room in the Italian style, more richly and finely decorated than is common in London libraries. Here is the marble statue of Locke. The books are chiefly the gift of Dr. Hulme, Messrs. Ricardo, Morrison, and other benefactors, whose names are recorded in gold letters under the cornice above. (See also article "Learned Societies," &c.)

Although not usually included under the Galleries of Art, the Glyptotheca in the Colosseum properly belongs to them, and is one of the London interiors most deserving of attention. It is a circular gallery under the dome of the Colosseum, supported by richly-decorated columns, and under which are models of works of modern

English sculptors finished in imitations of marble. The theatre of the Cyclorama in the same building is likewise worthy of inspection as a specimen of luxurious architectural decoration.

SCATTERED PICTURES TO BE SEEN IN THE PLACES HEREIN MENTIONED.

Distemper paintings in Carpenters' Hall, London Wall, viz. Noah building the Ark, King Josiah ordering the Temple to be repaired, Christ assisting Joseph at Work, and Christ teaching in the Synagogue.

Fire of London, by Waggoner. In Painter Stainers' Hall, Little Trinity Lane.

Holbein's Picture of Presenting the Charter to the Company of Surgeons. In Barber-Surgeons' Hall, Monkwell Street, City.

Magdalen, by Sebastian Franck. A small, pretty picture on copper, in Painter Stainers' Hall.

Picture by Hudson—A Conversational Party. In Goldsmith's Hall, Foster Lane, Cheapside.

Portraits of the Sovereigns Charles I., Charles II., James II., William III., Queen Anne, George III., and Queen Charlotte; also, Portrait of Pitt, by Hoppner; the Duke of York, by Sir Thomas Lawrence, R.A.; Portrait of the Earl (Chancellor) Eldon, by Briggs, R.A.; Portrait of the Duke of Wellington, by Wilkie, R.A. In Merchant Tailors' Hall, Threadneedle Street.

Portraits of the several masters and officers of the Merchant Tailors' Company:—Sir Thomas White, 1561; Sir Thomas Bow, 1562; Robert Dow, 1578; John Vernon, 1609; Robert Gray, 1628; Walter Poll, 1649.

Portrait of Queen Anne, by Chesterman. In the Council Chamber, Guildhall.

Portraits of several members of the Haberdashers' Company. In the Hall, Staining Lane, Cheapside.

Portrait of Nicholas Revett, Architect, who accompanied James Stuart to Athens, and who conjointly published the large work of Stuart and Revett's "Athens." In the Institute of British Architects. Presented by John Weale, of High Holborn.

Portrait of Thomas Telford, Engineer; Portrait of James Walker, Engineer; Portrait of Robert Stephenson, Engineer. In the Institution of Civil Engineers.

Portrait of Lord Hood, by Gainsborough. In Ironmongers' Hall, Fenchurch Street.

Portrait of Dean Colet. In Mercers' Hall, Ironmonger Lane.

Portrait of Sir Thomas Gresham. In ditto.

Portrait of Henry VIII., by P. Bordone. In Merchant Tailors' Hall, Threadneedle Street.

Portrait of Mrs. Crawthorne, 1568, who gave the Belle Sauvage, on Ludgate Hill, to the Company of Cutlers. Cloak Lane, College Hill.

Portrait of Lord Nelson, by Sir W. Beechey. In Drapers' Hall, Throgmorton Street.

Portrait of Mary Queen of Scots, and her Son James I. when a Child, by Zucchero. In Drapers' Hall, Throgmorton Street.

Portraits of William III. and Queen Mary, by Murray. In Fishmongers' Hall, London Bridge.

Portraits of George II. and Queen, by Shackleton. In ditto.

Portrait of the Duke of Kent, father of Her Majesty, by Sir William Beechey. In ditto.

Portrait of Admiral St. Vincent, by Sir William Beechey. In ditto.

Portrait of Her Majesty, by Herbert Smith. In ditto.

Portrait of Clarencieux Herald Lord Camden. (Painters Hall.)

Portrait of the Prince of Wales (father of George III.), by Frye. In Sadlers' Hall, Cheapside.

Portrait of Adrian Charpontico, painter. In Salters' Hall, Oxford Court, St. Swithins' Lane.

Portrait of Sir Andrew Judd, Lord Mayor, 1551. In Skinners' Hall, Dowgate Hill.

Portrait of the Duke of Sussex, by Sir William Beechey. As Grand Master in Freemasons' Hall, Great Queen Street.

Portrait of Sir John Cutler. In Grocers' Hall, Poultry.

Portraits of George III. and Queen Charlotte, by Ramsay; of George IV., by Northcote; of William IV., by Sir Martin Shee; and of Sir Hugh Myddleton. In Goldsmith's Hall, Foster Lane, Cheapside.

Portrait of Charles II., by J. B. Gaspars. In Painter Stainers' Hall.

Portrait of Charles II.'s Queen, by Hugsman. In ditto.

Portrait of William III., by Sir Godfrey Kneller. In ditto.

Portrait of Queen Anne, by Dahl. In ditto.

Portrait of Sir Hugh Myddleton, by Janson. In ditto.

Portrait of Sir Martin Bowes, and his Cup bequeathed to the Goldsmith's Company. In ditto.

Portrait of Her Majesty, by Sir George Hayter. In ditto.

Portrait of Queen Adelaide. By Sir Martin Shee. In ditto.

Portraits of Charles II., James II., Marie d'Este, and Prince George of Denmark, are in Vintners' Hall, Upper Thames Street.

Portraits of interesting literary characters—Prior, Steele, Richardson, Mrs. Richardson, Alderman Boydell, Wing the Astrologer. In the Stationers' Company's Hall. Also a fine picture by West, R.A., of Alfred and the Pilgrim.

In the South Sea House there are several curious portraits of the governors of that remarkable company which are worth seeing, especially by those whose families have been connected with commerce a century or so back.

A great number of fine pictures are in the possession of private individuals, but it would be useless to particularize these, as they are constantly changing owners; and many are in the town mansions of the nobility and gentry, besides the more important works already named.

GAS WORKS AND GAS LIGHTING IN LONDON.

A convenient and cheap mode of obtaining artificial light is, in these latitudes, one of the greatest advantages that science can confer on the inhabitants of a large city. Those who remember the night appearance of London fifty years ago, when the dim oil lantern in the street, and the flickering candle in the shop window, served for little more than to render darkness visible, will the more readily appreciate the brilliant illumination now seen almost universally throughout the metropolis. The introduction of gas lighting has not only tended to improve the thoroughfares, to render the traffic more convenient, and to stimulate the trade of the shops; but has also had a most important influence in protecting property against the attempts of the robber, to whom the dark and lonely state of unlighted streets and roads has always given encouragement and shelter.

Gas lighting is an invention of the present century, the first application of it, on any scale of magnitude, having been made by Mr. Murdock, at Soho, near Birmingham, about 1802. A year or two afterwards Mr. Winsor, a German, exhibited it for the first time in London, and projected a company, to be called the National Light and Heat Company, for the purpose of applying the principle on a large scale. In 1807, he lighted one side of Pall Mall with gas; and having obtained subscriptions to a considerable amount, proceeded to try experiments, in which he expended the whole of the money subscribed; his supporters, however, nothing daunted, persevered in their attempt, and in 1809 applied to Parliament for an Act of incorporation, to enable them more effectually and beneficially to carry on their works. They encountered much opposition, and their application was unsuccessful; but they returned to the charge, and in 1810 obtained their Act, which was followed on the 30th of April, 1812, by the grant of a charter of incorporation. This was the origin of "The Gas Light and Coke Company," more generally known as the *Chartered Gas Light and Coke Company*, the first established, and now the largest in London. Their first works were in Cannon Row, Westminster; but finding this site inconvenient, they removed to Peter Street, or Horseferry Road, where their principal establishment now stands. Their first trials on a large scale were very costly, as experiments of this nature must necessarily be; but in 1813 they engaged Mr. Samuel Clegg, whose name is connected with some of the greatest improvements in gas lighting, and soon after this time their arrangements rapidly improved.

After the successful establishment of this Company, others arose for lighting other districts of the metropolis, and the demand for the new light went on steadily increasing. We have no room here either to give the history of the various companies, or to trace the successive improvements by which the art of making, purifying, and distributing gas has arrived at its present state of perfection; we must content ourselves with briefly describing the state of things at present existing.

London is now supplied with gas by fourteen companies, having twenty gas-making establishments in different parts of the town and its suburbs.

The *Chartered Gas Company*, already alluded to, have three stations; the principal one in the Horseferry Road, Westminster; another in Brick Lane, Finsbury; and a third in Curtain Road, Shoreditch.

The *City Gas Company*, was established in 1817; their works are situate in Dorset Street, Blackfriars Bridge.

The *Imperial Gas Company* was established in 1821. They have three stations; one near Battle Bridge, King's Cross; one at Fulham; and one in the Hackney Road.

The *Ratcliff Gas Company*, established in 1823, have works at New Crane, Wapping.

The *British Gas Company*, established in 1824, have works in Broad Street, Ratcliff Highway.

The *Phœnix Gas Company* was established in 1824, and supply the south side of London only. They have three gas-making stations; one in Bankside, Southwark; one at Greenwich; and one at Vauxhall. They have also two separate gas-holder stations, one in Wellington Street, Blackfriars, and one at Kennington.

The *Independent Gas Company* was established in 1825, and their works are at Haggerstone.

The *Equitable Gas Company*, established in 1830, have works at Thames Bank, Pimlico.

The *London Gas Company* was established in 1833. Their works are in Lambeth, near Vauxhall Bridge, but their mains cross the bridge, and extend a considerable distance on the north side of the Thames.

The *South Metropolitan Gas Company* was established in 1834, and have works in the Old Kent Road.

The *Deptford Gas Company*, established in 1836, have works at Deptford Creek.

The *Commercial Gas Company*, established in 1840, have works at Stepney.

The *Western Gas Company* established in 1849, a station at Kensall Green, for the purpose of supplying the north-western part of London with gas, made from a peculiar kind of coal (Cannel Coal), and of a superior illuminating power to that supplied by the other companies*. The price charged is higher than for the ordinary gas; but a smaller quantity suffices to produce an equal light.

The *Great Central Gas Consumers' Company* was founded in 1850, in consequence of an agitation promoted in the city, for obtaining gas at a cheaper rate of cost than it had hitherto been afforded by the gas companies. Their works are at Bow Common.

The united investment of the companies is nearly 4,000,000*l*., and the average dividend paid has been between five and six per cent. The total amount received for the sale of gas in 1848 was upwards of 700,000*l*.

The general process of making coal gas is the same in all gas works. The coal, a compound of carbon and hydrogen with other matters, is submitted to a red heat in vessels of cast iron or clay, called *retorts;* by which hydro-carbon gases and other volatile products are evolved, and a solid residuum of coke is left behind. The coke, after deducting what is used for heating the retorts, becomes a profitable article of sale. The gas as it first comes over from distillation is very impure, containing volatile oil or coal tar, ammoniacal vapour, carbonic acid, sulphuretted hydrogen, &c. and would be in this state totally unfit for use; the *purification*, therefore, of the gas is one of the most important objects of gas making. The gas is first cooled and washed with water, whereby the tar and ammoniacal liquor are condensed and deposited, after which the carbonic acid and sulphuretted hydrogen are removed by exposing the gas to contact with lime * in close vessels called purifiers, and the gas is then ready for use.

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* Some of the other companies have lately begun to supply cannel coal gas, as well as that from Newcastle coal.

As the manufacture of gas must go on regularly, while the consumption is very irregular, it becomes necessary to provide means at each gas-making station, by which the surplus quantity made during the day time may be stored up ready for distribution when required. For this purpose large *Gas-holders* (or as they are often improperly called *gas-ometers*) are erected, consisting of huge sheet-iron vessels suspended by chains in an inverted position with their open mouths dipping in water; when the manufacture of gas exceeds the consumption, these vessels rise and fill with gas, which is again given out at the time of the increased demand. Some of these gas-holders are very large: one belonging to the Imperial Gas Company, situate at Battle Bridge, is 120 ft. in diameter, and 45 ft. high, and contains about 500,000 cubic feet of gas. Some gas-holders are double, one vessel sliding inside another like the tubes of a telescope, and are hence called *telescope gas-holders.* One of this description at Kennington, belonging to the Phœnix Gas Company, is 150 ft. in diameter, and has two lifts of 20 feet each; it contains nearly 700,000 cubic feet of gas. It is estimated that the various London gas companies combined have storage room enough for nearly 10,000,000 cubic feet of gas.

The gas is propelled by the weight of the gas-holders through cast-iron mains or pipes laid in the streets, from which it passes by small wrought-iron service pipes to the street lamps and into the houses. The gas mains vary from 26 inches to 2 inches in diameter, and it is calculated that there are 1900 miles of them laid in London and its suburbs.

The *burners*, where the gas is ignited as it issues, are of a great variety of forms. The most common are, the *argand* burner, in which the gas issues from a horizontal ring of holes, each about one thirty-second part of an inch in diameter, and forms a cylinder of flame; the *batwing* burner, whose name describes the form of its flame, the gas issuing from a narrow slit; and the *fish-tail* or *union jet burner*, where a narrow flat flame is formed by the meeting of two jets at an acute angle. A moderate-sized argand burner will burn 5, a batwing burner 4½, and a fish-tail burner 4 cubic feet of ordinary coal gas per hour.

Gas is now generally paid for by measure, the quantity used being ascertained by an ingenious little instrument fixed in each house, called a *gas-meter*, which indicates accurately the quantity of gas passing through. It was formerly the custom to charge consumers so much per light; but this plan causing much trouble and dispute, and being often unjust either to purchaser or seller, it is now almost entirely superseded by the other and incomparably better plan. The price charged has been subject to great reduction from time to time, as competition has increased and the art of gas making has improved. When the gas-meter was first introduced about 1820, it was fifteen shillings per thousand cubic feet; in 1848 it was six shillings. In that year an agitation was commenced for cheap gas, which ended in the formation of a new competing company, and in the reduction of the price to four shillings within and five shillings without the city. Public street lamps (for which about a quarter of the whole quantity of gas made is required) are charged, by agreement, at a lower rate. The charge for cannel coal gas is six shillings per thousand feet.

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* Several ingenious plans have been devised from time to time as substitutes for the use of lime, the objection to which is its expense and the difficulty of getting rid of the offensive resulting compound without causing nuisance. The most modern of these is Mr. Laming's patent process for the use of hydrated oxide of iron, which has been lately introduced with success at the Chartered Gas Works, by the superintendent, Mr. F. J. Evans. This material may be easily re-vivified in the purifier in order to be used repeatedly over and over again.

The cheapness of gas, as compared with other modes of procuring artificial light, may be seen from the following table* :—

Comparative Cost of Light from Candles, Lamps, and Gas.

	Quantities and Prices of Candles and Oil.			Quantities and Prices of Gas for an equal light.				
				Cubic feet.	At 5*s.* per 1000.		At 4*s.* per 1000.	
		s.	*d.*		*s.*	*d.*	*s.*	*d.*
Tallow candles (dips)	1 lb.	0	6	21	0	1¼	0	1
Ditto ditto (moulds)...	1 lb.	0	8	21	0	1¼	0	1
Composition ditto	1 lb.	1	0	25	0	1½	0	1¼
Wax ditto.....................	1 lb.	2	4	25	0	1½	0	1¼
Solar and pale Seal oil ...	1 gall.	4	0	175	0	10½	0	8½
Sperm oil	1 gall.	8	0	217	1	1	0	10½

This table shows that gas is only about one-sixth the price of tallow, or one-twentieth that of wax candles, and one-eighth that of sperm oil.

The annual consumption of coal for gas-making in London in 1849 was about 380,000 tons. It is principally brought from the Durham coal field, and its average price delivered at the gas stations in London is about 14*s.* 6*d.* per ton. One ton of this coal yields about 9000 to 9500 cubic feet of gas, and leaves a residuum of 13½ cwt. of coke in the retorts.

Gas has now a periodical literature of its own, a 'Journal of Gas Lighting' being published monthly in London (under the management of Mr. T. G. Barlow, gas engineer), for the purpose of circulating information interesting to gas companies and their customers.

The quantity of gas made in 1849 was 3,500,000,000 cubic feet, the ordinary maximum daily made being about 15,000,000 cubic feet. On some days, particularly on Saturdays in the dark season, a larger quantity than this is required; it is supposed that as much as 18,000,000 cubic feet are occasionally supplied in one day. The consumption of gas appears constantly on the increase. From 1827 to 1839 the annual quantity of gas consumed in the metropolis doubled what it had been from 1822 to 1827; and from 1837 to 1848 it again doubled what it was in the preceding ten years. And in consequence of the late reduction in price, it is confidently expected that the consumption will still go on fast increasing. New applications of gas are continually offering themselves, and, among others, *cooking* may be named as one of the most successful. Hitherto gas has been but little used in private houses, even for lighting purposes; but in proportion as unfounded prejudices and mistaken ideas respecting it disappear, and as the convenience, economy, and safety of its use become more appreciated, it cannot be doubted that the domestic use of gas will prove one of the most extensive branches of consumption.

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* Extracted with merely the alteration of the price of the gas, from a valuable little work on "The Advantages of Gas in Private Houses," by Mr. J. O. N. Rutter, 1850.

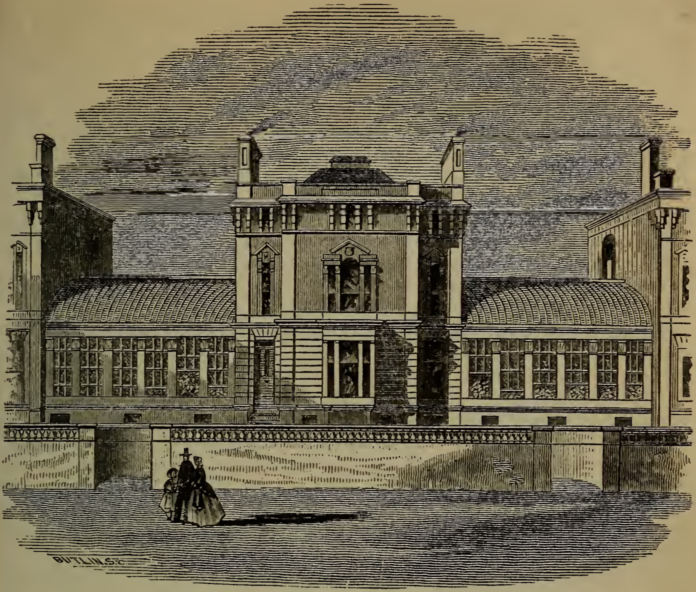
GARDENS, CONSERVATORIES, AND PARKS.

It is an observation so common as almost to have become trite, that whatever distinctive peculiarities may be found in any of the different provincial towns of England, something exceedingly like them will be discovered in one unnoticed corner or other of the vast metropolis. There are, it is assumed, types or examples in some part of London of everything that is thought to have only a local character in a great number of country towns. But whatever amount of truth there may be in this opinion, the state of gardening around the metropolis is usually and perhaps justly regarded as embodying all that is known of excellence throughout the country, and as affording a fair criterion by which the progress of horticulture may be judged. And though there will doubtless be places, in rural districts, where local advantages, or superior means, or unusual skill, may carry some particular branch of gardening to a higher point than is commonly attained around London, yet, in general, gardening practice, within a radius of twenty miles all round St. Paul's, will be in advance, or at least comprehend all the excellence, of what is done throughout the rest of the country.

A description of metropolitan gardening, or a tour of observation through the London gardens, ought, therefore, if these premises be correct, to include specimens of whatever is really meritorious all over England. Possibly, however, the rule will hold good more extensively in reference to practical matters than as regards questions of taste; difference of climate and other local features often developing peculiar local beauties.

In an ornamental point of view, the environs of London present several general characteristics. The valley of the Thames, from London up to Hampton Court, is rich in all the beauties which water-side villas and villages commonly impart. The neighbourhoods of Fulham and Putney, Kew, Isleworth, Twickenham, Richmond, and Teddington, may be specially singled out as affording pleasant banks and islands, or interesting villas. The celebrated villa of Pope, at Twickenham, has been converted into an extraordinary modern residence, in a mixed Chinese style; and Strawberry Hill, the seat of Horace Walpole, in the immediate neighbourhood, still remains. A handsome Italian structure nearly adjoins Pope's villa. The railway bridge across the river near Richmond has created a particularly good object in the scenery of that pleasing neighbourhood, and this is well seen both from Richmond Bridge and from a point on the river opposite to what was the Marquis of Ailsa's villa, at Twickenham. At Richmond Bridge there is a row of new villas just erected on the Middlesex side, which exhibits a very desirable mode of separating the houses in a short terrace, and breaking their outline, by placing a conservatory between every two of them (see illustration opposite). The subordinate entrances, too, are very well masked by a low wall which forms part of the elevation, and a balustraded wall is carried along the front of the whole. As respects their general elevation, and their fitness for composing parts of a landscape, there is much about these villas of a truly artistic character.

Hampstead is very well wooded, having some rather extensive open tracts of country and gentlemen's seats in its neighbourhood. From various parts of these hills, the views of London are extremely good; and the prospects into Hertfordshire, towards Barnet, as well as more westward, are exceedingly rich and varied.



RICHMOND TERRACE.

Between Hampstead and Kensal Green there are other inferior hills, which occasionally rise into swells, and are continued towards the west, presenting broad masses of trees and glades of grass, with admirable sites for villas. Farther westward, on the Surrey side of the Thames, Richmond Hill, and the high ground on which the Park is situated, stands up conspicuously, with its ample crown of trees; and this range extends back to Roehampton, and Putney Heath, and Wandsworth; affording numberless positions for villas, and being splendidly furnished with woods. There are probably some of the finest villas round London in this direction. Wimbledon Hill, which is almost on a level with Putney Heath, is yet in part detached by the low ground in Wimbledon Park, and, from a great many points around the parks of Mrs. Marryatt, Mr. Peach, and that formerly belonging to Earl Spencer, displays the most charming diversity of lawn and trees.

Cedars of Lebanon, of great age and size, constitute a peculiar and very observable feature in the landscape of the suburbs, and are unusually numerous on the west and south-west sides. As the adjuncts of stately mansions or elegant villas, along the valley of the Thames, they are remarkably telling; and the traveller can scarcely pass a hundred yards down portions of the western roads, without coming upon fresh specimens or groups of them. It is scarcely necessary to add that they communicate a very marked and aristocratic character to the district. And they are as beautiful in a young state as they are venerable and majestic when old. They are here met with in avenues, and standing opposite each other near a house, or on a lawn, or as single trees, or parts of a mixed plantation. But very rarely are they found grouped together in masses of three, four, or more on lawns or in parks. Those at Holland House are a distinguished exception, but they are unfortunately now so shattered as to have lost their principal beauty. No tree, perhaps, if we may judge from the imperfect examples we have seen, and the more satisfactory representations of those still existing on Lebanon, is better adapted to unite into a splendid group for a lawn, or for the slope of a park, or especially for a swell or knoll in either a park or garden, where they would be sufficiently sheltered. As trees for detached grouping, with their own species alone, both this and the Deodar have, we are convinced, yet to develop a new and most uncommon character in the southern counties of England.

Lombardy Poplars, again, are very freely (not often very judiciously) introduced into the scenery around London.

Beeches do not appear at home anywhere along the flat grounds near the Thames; but at Burnham, a little below Slough, there are some celebrated ones, growing on a thin, light, gravelly soil, and Windsor Park contains some superb specimens. In the neighbourhood of Sevenoaks, Kent, also, the beeches at Knowle Park are of the finest order, while those in the Marquess of Camden's park, adjoining, are superlatively beautiful, being planted on the slope of a hill, and spreading down their branches on the grass in the most graceful and natural fringe imaginable. On the top of a hill not far from this, but nearer London, are the famous Knockholt Beeches, which, standing alone in a large tuft, make a conspicuous landmark which can be seen for thirty miles around.

Of Spanish Chestnuts, we shall have some prodigious specimens to notice on a property of the Duke of Devonshire, near Chiswick. In Kensington Gardens, Greenwich Park, and other places, there are some very fine ones, which we shall also describe. It is a first-rate park tree for the low sheltered tract by the sides of the Thames; and is hardly enough esteemed. The extraordinary avenue of horse-chestnuts in Bushy Park will be referred to in the proper place.

Weeping Willows, especially in the Surrey suburbs, are much used in some of the smaller villa gardens; and though more commonly reserved for the margins of water in larger places, or for overshadowing tombs in cemeteries.

Those who visit the neighbourhood of London in the autumn, will be much pleased by the appearance of the Virginian creeper, which abounds on houses, cottages, walls, gateways, &c. The mixture of red and yellow and a purplish tint in its foliage at that season imparts a great richness to its appearance. It is most cultivated on the western side of the town.

Public Parks.—London, like most other large and populous towns, has gradually spread itself so completely over the open spaces which formerly surrounded it, that it is now, as respects the number of its inhabitants, by no means liberally supplied with breathing places, or the means of open-air recreation. And this encroachment on its suburbs has been effected with such comparative slowness, and so silently, that it is only by the occurrence of modern epidemics, producing that attention to sanitary matters which forms such a prominent feature of the present age, that the necessity for good public parks has been duly recognised, and the insufficiency of those already existing properly felt. Attention having, however, been awakened to the matter, the evil has already been in part remedied, and further provision for meeting the public wants is in process of being made. There are also many open commons in the vicinity of the metropolis, which, as we shall afterwards show, answer all the purposes of parks.

St. James's Park, being one of the oldest, and nearest to London, we shall first describe. It contains about eighty-seven acres, but must originally have been much larger; what is now Pall Mall having formerly been within the inclosure. First formed by Henry VIII., it was re-arranged and planted in the reign of Charles II. by Le Notre, the great French architect, by whom the gardens at Versailles were designed. At this period, a chain of small ponds was converted into a lake. Very recently, in the time of George IV., the whole was again remodelled, the lake greatly enlarged, and a number of new plantations added, as at present existing. This park is conspicuous for its fine sheet of water, which is kept full and pure by a supply from several water-works, and is much enlivened by an extensive collection of aquatic birds, belonging to the Ornithological Society, which are a source of constant interest and amusement to the public. The eastern end of the lake is tolerably well masked by a long island, which is, however, almost entirely clothed with willows, and there is here a pretty Swiss Cottage belonging to the Ornithological Society, and used as the residence of their keeper. There is a fountain at the western end, opposite Buckingham Palace. The margin of the water, on the northern side, adjoins a gravel walk for some distance, and being unprotected against the action of winds, forms a hard and disagreeable line. As a rule, vegetable forms only are at all adapted for uniting with water along its margins, when these are tame and flattish; and grass, relieved by specimens or masses of shrubs and trees, is in such cases by far the most appropriate. Where the banks are steeper and bolder, rocks or roots, sprinkled irregularly over the surface, and accompanied with more ragged and wilder plants, will be exceedingly desirable.

Numerous winding walks conduct the pedestrian sometimes between the new plantations and sometimes along the side of the water; but the public have also free access to the grass in all parts. In addition to a considerable number of fine old elms which yet remain, there is a large collection of ornamental trees and shrubs in the younger plantations, and most of the rarer kinds have their names, native country, year of introduction, and tribe to which they belong, neatly painted on iron labels. The borders are also filled with the common kinds of herbaceous plants and annuals, which, however, present but a starved appearance.

The principal circumstance worthy of notice in this park is the glimpses or views which are obtained, in walking about it, of so many noble or striking architectural objects, to which the old elm trees form such varied and excellent foregrounds, supports, or frames. In no other place that we have seen, are so many striking combinations of this kind produced. From several of the London bridges, a far greater variety of objects may be taken in at a glance; but the wooding and the park are altogether wanting as a foreground. As seen from this park, however, we may particularly mention the towers of Westminster Abbey, which are well introduced and well accompanied from so many points; the New Houses of Parliament, which, when completed, will afford several excellent groups; Buckingham Palace, as viewed from the east end of the lake, near the Swiss Cottage, the entire length of the lake stretching out between the palace and the observer; the Duke of

York's and Nelson's Columns; with Carlton Terrace, Marlborough House, and a variety of other mansions. Even inferior houses, or such as have no great architectural pretensions, acquire a character, and make pleasing parts of a picture, when they appear half shrouded with venerable trees.

On the north side of the park, but not within the railing, is the Mall, which is composed of four broad avenues of trees, three of which are appropriated to pedestrians only. One of these avenues conducts to the centre of Buckingham Palace, which is thus advantageously seen at the end of a long vista. The trees forming these avenues appear to have been all elms at one period; but as some of these are dead, they have, unhappily, been replaced by elms, limes, and planes promiscuously. If the whole of the trees in these avenues could be allowed to stand on a broad strip of turf, the ground being well broken up and renewed before the grass was laid, they would certainly be shown to more advantage, have a more natural appearance, and probably stand a better chance of becoming and remaining healthy. Beneath the trees, a great number of seats are provided for the public use, as well as in the park.

The *Green Park*, separated only from St. James's along part of one of its sides by the Mall, is a more open area of fifty-six acres, which was at one period larger, but was reduced by George III. to enlarge the gardens attached to Buckingham Palace. A few years ago it was much improved, on the Piccadilly side, during the time when Lord Duncannon was Chief Commissioner of Woods and Forests, by the removal of the old ranger's house, and throwing the whole of the gardens, &c., into the park. From the higher ground near the reservoir at the north-east corner of the park, commanding and beautiful views into Surrey may be obtained, including the Norwood and Wimbledon hills, and more distant prospects. Along the east side are several first-rate mansions, especially Stafford House, at the lower corner. The close fence which surrounds the garden is curious, as being made of slate. Bridgewater House, which is next to Stafford House, has just been built for the Earl of Ellesmere by Mr. Barry, and is a particularly fine specimen of an Italian mansion, with the garden arranged architecturally, and intended to be surrounded, apparently, with a balustraded wall. Among the commonplace and paltry gardens attached to many of the best houses in this part of London, the visitor will be pleased to see this attempt to elevate one of them into something like character. But it is impossible to include in this commendation the mean bank of shrubs which screens the basement story of the building; which may, however, be only temporary, and be intended to be replaced by an appropriate ornamental wall. If this idea of an architectural town garden, where the area is so small, can be carried out effectively, and all the details be well filled in, it will be worthy of the mansion which it accompanies. Spencer House, the town residence of Earl Spencer, adjoins Bridgewater House. The purple lilacs and laburnums seem to succeed very well in the gardens here. There are some very flourishing young trees and handsome thorns in the park near this corner; and they here contribute greatly to relieve the boundary line, suggesting the advantage that would be derived from a few more, higher up, where they could be more boldly thrust into the park. At the entrance to this park from the west end of Piccadilly, there is a handsome triumphal arch, designed by Mr. Decimus Burton.

Hyde Park is entered from Piccadilly, opposite the triumphal arch, by a series of three arches, with a screen and lodge, also designed by Mr. Decimus Burton. Apsley House, with the gardens at the rear, is on the right-hand corner of the entrance to Hyde Park, which contains 349 acres. There are other entrances from Park Lane, from the end of Oxford Street, and from Bayswater, with one from Kensington, and two comparatively new ones at Knightsbridge, and another from Kensington Barracks.

A large portion of this park being high, dry, and very little cumbered by trees, it is, perhaps, the most airy and healthy spot in London. It is, therefore, an excellent place for walking in, and has many paths, which are well kept, and can be used at pleasure by the pedestrian, who may also walk anywhere on the grass if he prefers it. Excellent drives, which are diligently attended to, and from which all but private vehicles are excluded, likewise furnish the means of enjoying carriage exercise, and make this one of the most frequented resorts of the higher circles, at all seasons, but especially from April to July, and between the hours of five and seven, P.M. It was even thus fashionable for drives and promenades in Charles II.'s reign. There are here, too, peculiar facilities given to equestrians in a road known as Rotten Row, where the fine gravel is always allowed to remain loose, so that horses can gallop over it without the least danger from falling. And as the road is devoted solely to this purpose, while it extends, probably, almost two miles in length, it affords ample scope for horse exercise, and is much used. Adjoining this road, in a large open green space between the Cavalry Barracks and Kensington Gardens, is built the Exhibition Palace.

One of the park drives leads to a sheet of water called the Serpentine, part of which is in Kensington Gardens, the division being effected by an elaborate stone bridge, built by Rennie in 1826, which, having a fence along its centre, is useable by persons either in Hyde Park or Kensington Gardens. The Serpentine is a long canal-like piece of water, covering fifty acres, with no particular character, but expanding into a broad sheet at the south end. On the east margin, near the receiving house of the Royal Humane Society (which was designed by Mr. D. Burton), are several boat-houses, some of which belong to the Royal Humane Society, whose officers are always on the alert to prevent accidents from bathing or skating. At this point, also, sailing or rowing boats may be hired during the summer season, and, besides affording an agreeable recreation, they give a great deal of animation and finish to the water, which would otherwise have but a dull appearance. During a calm afternoon, when the water is thus studded with a variety of little vessels, and the banks are dotted over with gay company, and enlivened by passing equipages, this water assumes its most attractive aspect. Early in the morning, under certain restrictions, it is extensively used as a bathing place, as many as 12,000 persons sometimes bathing in it on a Sunday morning.

Behind the receiving house of the Royal Humane Society is a large government depôt for gunpowder and military stores, and on the south side of this are some of the best and oldest elm trees in the park. A little below the south end of the Serpentine is an ancient spring, from which a draught of pure water may be always obtained. Opposite the principal entrance from Piccadilly is a huge statue of Achilles. This, and the equestrian statue on the triumphal arch at the Green Park entrance, are appropriate testimonials, in the immediate neighbourhood of Apsley House, of the national esteem for the Duke of Wellington's character and actions. (See the article "Statuary.")

From the high ground between Hyde Park Corner and the Edgware Road, the best notion of the character and advantages of Hyde Park may be obtained. Here, looking westward, the old trees by the margin of the Serpentine form a broken fringe to some parts of the horizon, and occasional bursts of the gleaming water are caught through their stems, while the more ample woods of Kensington Gardens stretch farther into the distance. On the south, some of the Surrey hills are also visible, and several church towers and spires, on various sides, with a few other good buildings, rise as it were out of the midst of the park trees, near the margin, and furnish centres for some very effective groups. Over this high ground, too, are frequently, during the summer, spread some of the best metropolitan reviews, which, in themselves, often compose the finest pictures, and which set off the open space of the park to the highest advantage.

It will be observed that the three parks already described are in one continuous chain, occupying nearly 500 acres. Kensington Gardens, including 300 acres more, are virtually an extension of Hyde Park, thus bringing the whole of this fine park space into one area. Before George II.'s time, indeed, nearly the whole of these gardens were actually included in Hyde Park; Queen Caroline having enclosed them, and formed the Serpentine out of a number of small ponds. In the year 1550 the French ambassador hunted with the king in Hyde Park, which was then well stocked with game, and kept as a royal enclosure. The iron railing now extending along the south side was substituted for a close wall in George IV.'s reign; and the open railing along the Bayswater Road has since very properly been put up in place of a similar wall, so that passengers along the outside roads get the full benefit of the open space and trees. More recently still, a noted old half-way house, on the Knightsbridge Road, which had become a great nuisance, has been destroyed, and a new entrance made near the site of it. It is this entrance which will give access to the centre of the wonderful glass palace. Hyde Park, celebrated already for many interesting historical events, and as the place of daily concourse for all the aristocracy resident in London during "the season," will henceforth be noted chiefly as having supplied the site of, perhaps, one of the greatest and most important gatherings the world has ever witnessed.

Regent's Park, which probably comprises about 450 acres, is situated on the north-west side of London, and is of modern foundation, although it was once the site of an old Marylebone Park. In this park, the comparatively recent principle of letting off part of the land for villas and terraces has been adopted; and several fine villas, with ample pleasure grounds, besides a number of stately terraces, which are built so as to present two good fronts, the offices being kept in the basement, and concealed, adorn and improve the park rather than interfere with its effect. The handsome villa of the Marquis of Hertford, on the north-west side is, especially, a conspicuous ornament, but the plantations about it, chiefly composed of poplars, are of the commonest and most inferior character, and quite disfigure both the house and the park. Mr. Bishop's mansion and observatory is an object also of science and beauty.

Regent's Park was laid out in 1812 by Mr. James Morgan, from the designs of Mr. Nash, architect, by whom the principal terraces (with one or two exceptions, which were done by Mr. D. Burton) were planned. It was named after George IV., then Prince Regent, who is said to have contemplated building a palace on the north-east side. We are informed, however, that Mr. Nash reserved the inner circle, now the Botanic Gardens, as the site for this proposed palace. The park was not opened to the public till 1838. The full extent of this, which is decidedly one of the finest of the London parks, is nowhere seen, in consequence of the public road crossing it towards the south end, and the inner circle being taken out of it. And besides the inner circle, it includes the site of the Zoological Gardens, which are on the north-west side. The garden of Baron Goldsmid, near the inner circle, rather enhances the beauty of the park, being so well seen from the opposite side of the lake. The Coliseum, on the east side of the park, with its ample dome, contributes much to the effect from various points.

That part of the park near the ornamental water is in all respects the most interesting. The water itself is of a good form, with its terminations well covered, and several fine islands, which are well clothed with trees. It lies also in the midst of some villas and terraces, from which it receives additional beauty. It is on the south side of the park. Some noble weeping willows are placed along its southern margin. Three light suspension bridges, two of which carry the walk across an island at the western end of the lake, are neat and elegant, but the close wire fence at their sides sadly interferes with the beauty of their form. These bridges are made principally of strong wire rods. It is to be regretted that the material which came out of the lake at the time of its formation has been thrown into such an unmeaning and unartistic heap on the north side; although the trees which have been placed upon it in some measure relieve its heaviness. Here, perhaps, more than anywhere else, a good mass of shrubs, as undergrowth, would have been of the greatest assistance. Passing along the western road from Portland Place to the inner circle, there is a very picturesque and pleasing nook of water on the right, where the value of a tangled mass of shrubs for clothing the banks will be very conspicuously seen.

Between the water and the top of the long walk lies the broad open space we have before mentioned, which is on the slope of a hill facing the west. Perhaps, as this area is intersected with several walks, it may be a little too bare, and might possibly be improved by a few small groups of trees or thorns; but, in parks of this description, such a breadth of grass glade, especially on the face of a hill that does not front any cold quarter, is of immense value, both for airiness and for effect. It will only want some scattered groups of trees along the edge of the slope, near the summit, to form a foreground to any view that may be attainable from the top of the hill, and also to get a broken horizontal line when looking up the slope of the hill from the bottom. The space we are speaking of is by no means favourably circumstanced in the latter respect, as the hill is crowned by the fourfold avenue of the long walk, which presents an exceedingly flat and unbroken surface line. This consideration renders it very undesirable to carry avenues over any kind of eminence, when they are at all likely to be viewed from the side, and particularly when they are seen from lower ground.

Almost adjoining Regent's Park on the north-west side is Primrose Hill, to which the public have free access, and which is a very favourite spot for a summer ramble. It is in the form of a large roundish swell or knoll, and, being unplanted, affords views of a very ample and diversified character, besides yielding admirable exercise to those who are vigorous enough to run up and down its face.

Greenwich Park was laid out by Le Notre about the same time as St. James's, and contains 200 acres. Now, however, except in the remains of many of the avenues, there are happily not very strong traces of the formal style of that artist left, as it is not on a beautifully-varied surface like this that straight walks and regular lines of trees are at all tolerable. The natural advantages of this park are superior to those of any yet described. The ground itself is undulated with great variety, sometimes being thrown up into the softest swells, and in other places assuming a bolder and more sudden elevation. Around the site of the Observatory it is particularly steep, and attains a considerable height. Everywhere, too, it is studded with noble specimens of ancient trees; and in this respect there are none of the other London parks at all equal to it. Some of the best trees are Spanish chestnut, and the largest are on the south side. Many of these are truly fine and venerable, and would command admiration even if found in the heart of a purely rural district. The elms, which are abundant, are likewise large and noble; and there are some picturesque Scotch firs in the neighbourhood of the Observatory. These last are old enough to show the peculiar warm reddish colouring of the stems, and the characteristic horizontal or tufted heads. In this state, the Scotch fir is certainly one of the most picturesque trees we possess, and is the more valuable because each individual plant commonly takes a shape and character of its own.

The avenues still remaining in Greenwich Park are composed chiefly of elm and Spanish chestnut, the latter being mostly confined to the upper part of the park. They are of different widths, and take various directions, many of them not appearing to have any definite object, and some being formed of two single rows, others of two double rows of trees. But there is one avenue, perhaps the finest, which, widening out at the base to correspond with the width of the Hospital, is there composed of elms, but as it ascends the hill is made up wholly of Scotch firs, which are exceedingly good. In a general way, the trees in the avenues have been planted much too thickly, and have greatly injured or spoiled each other. In many instances, too, where plants have died out, they have been replaced by a most unhappy mixture of sorts, which, being also very poor specimens, detract much from the effect. At the upper part of the park are some aged and fine thorns, which have become very picturesque.

Victoria Park, on the north-east side of London, near Hackney, was commenced in 1842, and opened in two or three years from that time. It contains nearly 300 acres, and is chiefly for the use of the large and crowded districts of Bethnal Green, Whitechapel, and Shoreditch. The site of it is in no way an inviting one, and it is severed into two parts by a public road. But it is marvellous what a few trees, well disposed, and a little skill in the shaping of ground, and in the arrangement of walks and roads, will effect for a place in five or six years. For even here, where everything has been done in the most imperfect manner,—the trees in irregular plantations being placed in rows; the walks and roads made to follow every little irregularity of surface, and even to be more irregular than the ground itself; the ground, which was newly sown down with grass, not at all levelled; and the margin of a large sheet of water left with a steep gravelly bank from one to two or three yards in nearly perpendicular height,—such is the softening and ameliorating influence of trees, that the mere plantations already begin to produce an air of comfort, and shelter, and variety.

Richmond Hill and Park.—Frequently as we have been attracted to Richmond Hill by the high estimate in which its scenery is popularly held, we have always returned from it with some degree of disappointment. Much of the beauty of any scene will of course depend on the state of the atmosphere; and there may occasionally be times when even the most common-place combinations will be so favourably lighted up, and so exquisitely tinted, while their defects are just sufficiently veiled in a kind of luminous mist, that they will appear perfectly charming. On the other hand, there will more frequently be seasons when, by a bad arrangement of the lights with respect to the position of the spectator, or by a deadening gloom, in which no individual features acquire their proper character, even beauty degenerates into dulness. But allowing for all these changes, the prospect from Richmond Hill, or that part of it where the terrace walk has been formed, opposite the Roebuck Inn, has never appeared satisfactory to us. Take away the river from the scene, and it at once becomes tame, and inferior to fifty others at a less distance from London. But as we are aware that the river is considered the chief object, we may remark that there does not appear to be enough of this visible to make a really fine landscape, and the nearer margin of the part that is seen is extremely bare and meagre. To render the view of such a river good, a considerable length of it should be seen, or several of its windings, or it should widen out and encompass two or three picturesque islands, while the banks should be clothed chiefly with herbage, with occasional tufts of bushes and shaggy weeds, or larger masses of trees. Nothing could be more defective than the margin of the Thames on the side next Richmond Hill. It is simply a rough towing-path, without any assistance from vegetation. And nearly the whole of the ground between the river and the top of the hill is similarly inharmonious. Indeed, the great and radical deficiency, which would ruin almost any such prospect, is the want of a proper foreground. If, near the top of the slope, which is admirably fitted for the purpose, a few irregular groups of trees and shrubs, with occasional tufts of such plants as thorns, or furze, or broom, a little lower down, were introduced, the whole would at once take a new character; and though that would not alter the position of the river as viewed from this point, it would transform the entire scene into something infinitely better.

Higher up the hill, by the Star and Garter Hotel, a greatly superior view of the river may be had; and in a warm calm evening, when the light from the setting sun, or the reflection from the clouds after he has gone down below the horizon, is thrown full on the still water, the aspect of the river from this spot is very lovely. There is still, however, the want of a suitable foreground.

The park at Richmond, which is 10 miles from London by the South-Western Railway, or 15 by the river, is of great size, including no less than 2253 acres. To those who are not so particular with regard to time, we recommend, in favourable weather, and when the tide is rising, the route from London by a Thames steamer, as one which would yield a much richer variety of scenery, reveal many pretty villas, and be altogether more pleasant. But on no account should this course be taken when the tide is flowing out, as the banks of the river are then most disagreeable, and very little can be seen; and there is always the chance of the boat running aground.

There are many entrances to Richmond Park. Besides the principal one, which is opposite the Star and Garter Hotel, there is one for Kingston, another at Roehampton, a third towards Putney, and a fourth at East Sheen, with some others. Entering at the Richmond gate, the visitor, if walking, should strike off by the footpath to the right, and never touch upon the drive again till he crosses it where it descends to the Kingston entrance. Rambling along under the fine old trees, a group or two of handsome middle-sized horse-chestnuts will soon be observed on the left, exhibiting the desirableness of planting two or three trees of one sort together in parks. The house on the right, which is speedily reached, is the present residence of Lord John Russell, the site of which is a truly enviable one. Farther on, the bank begins to take a rougher and wilder character, and to be dotted about with tangled bushes, and clothed with fern. Along the sides of the footpath, too, among ancient oaks, of various character and sizes, specimens of fine old thorns, most picturesquely clothed or half-clothed with masses of ivy, begin to abound, and are thickly scattered over the brow of the hill at intervals, for nearly a mile. The lover of picturesque forms will find many a beautiful picture among these thorns, especially if seen just after the young leaves have expanded, or when they are in bloom, or after the foliage has begun to change colour and the haws to ripen. In all these stages, they present the most striking contrast to the ivy which invests them, and which is now seen jutting out in broad patches, then retiring, then just peeping forth and again retreating, and sometimes clothing the summit with a complete crown of dark green, the flowers and incipient fruit being very beautiful in autumn.

If the park be now skirted, in the direction of Wimbledon, an extensive young plantation of oaks on the right will be seen to have a quantity of Deodars and others of the Conifer tribe recently introduced in different spots, and protected from the game. These will no doubt some day become attractive objects in the park, when they have acquired sufficient age to be relieved from protection, and to stand out by themselves. Views of Wimbledon Common and Putney Heath begin next to unfold themselves, and the White Lodge, the house of the ranger, now occupied by H.R.H. the Duchess of Gloucester, is approached. In the neighbourhood of this villa there are some admirable park-like scenes, comprehending several beautiful specimen trees, broad and bold glades of turf, portions of an ample lake among the trees in the hollow, a finely-broken woody and hilly horizontal outline, and, on the north side, a splendid glade, which has all the effect of an avenue, without any of the trees being in lines. This is a most interesting and artist-like vista, which only wants terminating by some object large and good enough to justify its employment; although the house, of course, supplies such an object from the other side of the park. (See also pp. 882, 883.)

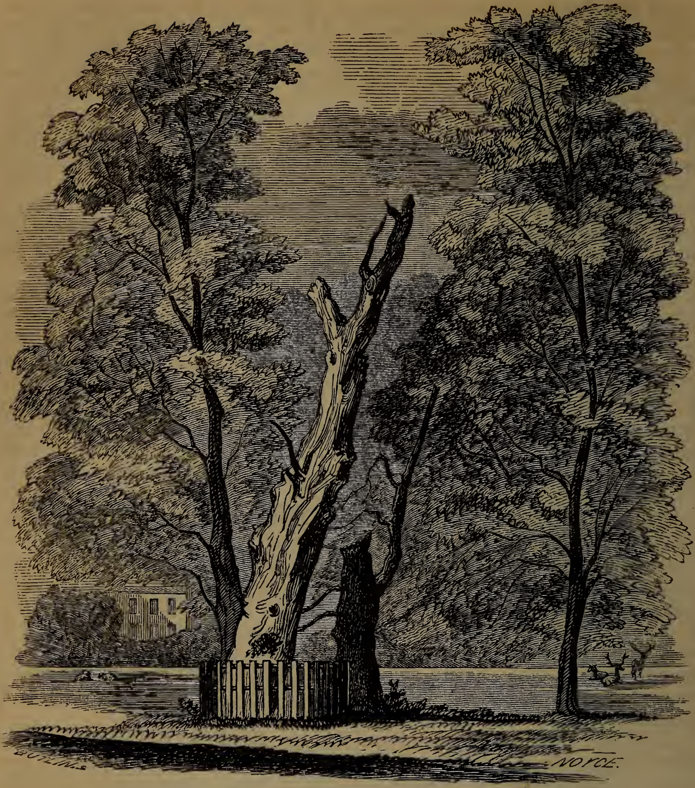
Windsor Park, which is now made less than an hour's ride from London by both the South-Western and Great Western Railways, is divided into two portions, the Little and the Great Park. The former of these, occupying about 500 acres, lies more immediately around the Castle, on the east and north sides, and is only so far accessible to the public as that there is a free path across it from Datchet to Frogmore, and the road which at present runs from Staines to Windsor is, for part of its course, within this park. The North Terrace at Windsor Castle further overlooks a large portion of the Little Park, and the South-Western Railway now crosses a corner of it. Since the Windsor branch of the last-named railway was formed, a small new lodge has been erected near the terminus, and a drive made to conduct to the castle by going through the Little Park, and round the east end of the castle. The necessity for passing through Windsor town has thus been avoided; and an avenue of Deodar Cedars has been planted along the straight portion of this drive, until it enters among the old trees of the park. The hideous wall which formerly bounded the Little Park on the northern side has also been removed; and Her Majesty, with great liberality, has allowed space for cricket-playing in that part of the park.

But a most important alteration in the arrangement of the Little Park has further been commenced, and will probably soon be carried out. It is the diversion of the road which now enters Windsor, by way of Frogmore, along the south front of the Castle, and throwing it into the Long Walk by carrying it at the back of the Frogmore Kitchen Gardens. The path from Datchet to Frogmore, which now crosses the Little Park, will then, it is said, have to be abandoned. This will get rid of the cramped appearance of the Little Park on the south side, and render that part of the park much more worthy of the castle. (See page 869.)

The path from Datchet across the Little Park reveals nearly the whole of it to the public, except a portion immediately beneath the east front of the Castle. Near the Frogmore end of this walk, at a short distance to the east, is the Queen's dairy; and one of the shattered and decaying old oaks, which are seen about the highest point of the walk, and which is surrounded by a paling, against which ivy is planted, is said to be the famous Herne's oak spoken of by Shakespeare, and here portrayed in p. 452. There are several other ancient oaks in the neighbourhood of this. Frogmore Lodge, the residence of the Duchess of Kent, is included in the Little Park.

Until the reign of Queen Anne, Windsor Castle was severed from the Great Park, which has been a part of Windsor Forest, by private property. At this period, however, sufficient land was purchased by the Crown to connect the Castle with the Great Park by means of what is styled the "Long Walk," and its accompanying avenue. Magnificent as this avenue is, and nobly as it maintains the connection between the Castle and the park, every visitor of taste will regret that so superb a palace should have anything but Crown property lying between it and the Great Park, and that the communication between the two should be so contracted. It may be allowed that nothing could better atone for or disguise during summer the meagreness of this strip of land than the double avenue which has been created, and which is one of the happiest possible ideas. But still the fences, and the houses and gardens, fields and farms behind, *will* force themselves into notice; and, in spite of all effort, help to divorce this truly regal castle from the equally magnificent park.

The drive known as the Long Walk is described as three miles in length, in a straight line, and is supported on either side by two rows of elms, which have attained their full size, and, with a few very unimportant exceptions, are yet in the greatest vigour and luxuriance. This



HERNE'S OAK IN WINDSOR PARK.

avenue will be sure to strike the visitor as exceedingly grand. It is somewhat marred, however, by being carried over a considerable swell in the ground about half way up it, which helps to shorten its apparent length, and to make the drive seem as if it were not straight, while a more decidedly objectionable feature is, that it ascends a hill *away* from the Castle at the further end. If there are any two circumstances which, more than others, require to be kept in view in the formation of avenues, they are that the ground over which they run should be nearly level, or have one continuous ascent towards the mansion or principal object to which they lead; and that, consequently, this object should be on the highest ground, at least as respects the avenue. Any avenue that commences on a hill, and passes *down* that hill towards its terminating object, even though it afterwards rise again near the end, must ever appear to some extent inverted; and every undulation or swell of the ground in it will necessarily be a deformity. The idea which is conveyed to the mind by the elevation of the Long Walk at Windsor, as it reaches its termination in the Great Park, is, that the castle ought to be somewhere about the site of the statue of George III., by which this walk is so appropriately finished.

Those familiar with the Champs Elysées at Paris will remember that the Grand Avenue there, like this at Windsor, is partly on a steep ascent, *away* from the palace of the Tuileries to the Triumphal Arch at the summit. And although this circumstance enhances the effect as viewed from the front of the palace, yet, regarded as an approach *to* the Tuileries, it causes the latter to appear more or less buried in a low marshy tract.

Some notion of the length of the Long Walk will be formed when, in standing near the Castle, the visitor is informed that the equestrian statue of George III. at the top of the walk is, including the pedestal, above 50 feet high; and that the statue itself (man and horse) stands 26 feet in height. It was designed by Westmacott, and erected by command of George IV. No termination to such a walk could be more felicitous; and as the visitor approaches it, he will find that the pedestal or base has been very artistically constructed of large rude blocks of stone, to resemble a natural mass of rock; and the peculiar roughness of the site, with the tasteful diffusion of a few large stones about the neighbourhood of the pedestal, fitly harmonize with and carry out the idea.

From this elevated spot, some conception—though a very inadequate one—may be formed of the character of the Great Park, which extends, however, a considerable distance to the south, where it cannot be seen, and embraces an area of 1800 acres. The views from this point towards the Castle, and in an easterly and north-easterly direction, are truly magnificent; and the steep ascent round the statue should by all means be climbed, in order to command the scenery more perfectly. Those who happen to be on foot should strike across the park in a south-easterly course from the statue, by a partially beaten foot-path, for Cumberland Lodge, where a greenhouse and small garden (once much frequented by George IV.) are shown to the public, and from whence Virginia Water will be reached in little more than a mile.

At Cumberland Lodge is a vinery containing a vine of the black Hamburgh kind, which is, in some respects, said to be even more extraordinary than the far-famed one at Hampton Court. It has a stem which measures two feet nine inches in circumference, and covers the roof of a house 138 feet long by 16 feet wide. In the autumn of 1850 it had 2000 bunches of grapes upon it, both bunches and berries being large and well ripened. No particular preparation seems to have been made for it, as it was only growing in a light, dry, shallow border.

Some of the most enchanting park scenery, with trees fully worthy of it, will be found in various directions around the statue, and between it and Virginia Water. The admirer of the picturesque will here be able to roam about amidst scenes that will supply new features for examination at almost every step. And yet the greatest unity and harmony of character will be observable.

Arrived at a line of fence and a porter's lodge, not far from Cumberland Lodge, those who wish to see the whole of Virginia Water should inquire of the porter for a path to the left, by way of a tall pillar which will then be visible; and by this route they will be able to make the entire circuit of the lake. The plantations will now be seen to have a far younger look, and there are some beautiful tufts of young birches (a tree much too seldom used in park decoration) on the left, among which, and mingling with the thousands of common rabbits which will be seen here, is a large quantity of purely white rabbits, which have a very lively and pretty appearance, and are quite worth introducing into extensive plantations, for their beauty.

Leaving the pillar, erected by George III. in memory of the military achievements of the Duke of Cumberland, on the right, and following one of the green walks or drives (with which the woods here are frequently intersected) in a nearly straight course, the visitor will come at length to a rocky waterfall at one of the heads of the lake, and taking a path to the left, if the gate is closed, he will speedily find himself on the grassy margin of the lake, where he will notice some extraordinary specimens of the Scotch Laburnum, and from which the views of both water and plantations immediately become very attractive. This lake is said to be the largest sheet of artificial water in the country, and covers several hundred acres. In its general outline, it has been particularly well treated, and presents a great deal of variety.

Walking along from the point at which we have supposed the visitor to come first upon the lake, in about a quarter of a mile he will arrive at the overflow from the water, which is conducted over a number of bold masses of rock, so as to form a broken cascade. This waterfall has likewise rocky accompaniments at the side, and is best seen from the bridge below it. The whole has been much praised, as conveying a favourable impression.

From the site of the waterfall to a little beyond the classic ruins, the most satisfactory part of the whole of the scenery on the borders of this lake will be found. Here there is a good open glade of grass on the slope of a bank, upon which a cottage is situated, and the sides of the drive are more irregular, and groups of trees, with some tasteful masses of rocks, interpose at intervals between the drive and the lake. In a recess on the left, near a massive archway which leads beneath the public road, there is a collection of the Elgin marbles, piled together in a variety of classic shapes, and very tastefully grouped. A number of middle-aged Scotch firs and other pines contribute additional interest to this pleasing nook.

From the eastern and southern fronts of the Castle, as well as from the Little Park and Frogmore, that portion of the Great Park which lies eastward from Snow Hill exhibits a very varied and charming character. Extending along the ridge and slope of a hill, the trees about the summit are most pleasingly, yet softly, broken up, and the face of the hill is adorned with large masses of trees, here and there (but most irregularly) intersected with patches of greensward.

On the whole, the Great Park at Windsor is, like the Castle, quite unrivalled. Each is worthy of the other; and both together compose a fitting and most truly royal abode for the Sovereigns of Great Britain. The only cause for regret (which is of course unavailing) is, that this superb castle does not stand in the midst of its magnificent park. It should, perhaps, be mentioned that the Great Park is the Windsor Forest of former times, which has been celebrated by Pope and other poets.

Battersea Park, though not yet formed or even begun upon, is to supply a new recreation ground for the dense population of Vauxhall, Lambeth, &c., and to secure the present open space, which goes by the name of Battersea Fields, from that encroachment of dwelling-houses and streets to which it was rapidly yielding. This is an object for which an Act of Parliament has been obtained, and to carry which into effect the Government are only waiting for means. Battersea Fields, the site of this contemplated park, include, we should suppose, more than 200 acres. The ground is situated by the side of the Thames, opposite Chelsea Hospital, and the South-Western Railway runs along within a short distance of its south margin.

A park for the *Finsbury* district of London has also been for some time contemplated, and the local authorities have repeatedly moved in the business; but the Government do not appear, at present, to be in a position to allow them pecuniary aid, being in a manner pledged to proceed with Battersea Park, when funds can be spared. The proposed site of the Finsbury Park is in the neighbourhood of Highbury, and would include nearly 300 acres. From the astonishing quickness with which the suburbs of London are becoming filled up with streets and houses, notwithstanding the tendency which railways have to draw off the people to reside farther from town, every attempt to snatch a clear piece of country from the general fate, and to provide a belt of pure air, or the means of obtaining it, entirely around the crowded seats of business, should be delightedly hailed, and strenuously fostered.

Clapham Common, which is in all respects the best, and the nearest to London, has an area of about 200 acres, and, being altogether on high land, is an exceedingly healthy and pleasant spot. It possesses a great many fine groups of trees, and, on the south side, we may specially notice a number of comparatively modern clusters, in which the principle of planting two or three trees of one sort by themselves has been adopted, and the heads are growing together so as to look like one handsome specimen. Several walks and roads traverse the common; and ponds—some of them deserving the name of small lakes, with islands—are of frequent occurrence.

At a very little distance from this common, by either the upper or lower roads, Wandsworth Common is reached, which is also a large tract of ground. On the north side of this, fronting some villas which are locally known as the "Five Houses," the trees, again, are most judiciously arranged to cover the boundary; and along the south-east side, some open fields allow the eye to travel across to the villas, gardens, and plantations of Balham and Brixton Hills.

A short walk, of less than half a mile, from the south-west corner of Wandsworth Common, is Tooting Common, in Streatham parish. A place on the right, shortly after this common is arrived at, with a park paling in front, was nearly all a part of the common a few years ago, and the ornamental water in front of it was made out of some old gravel pits. Onwards is the bottom of a fine avenue of elms, which ranges along the front of a house and park once occupied by Mr. Thrale, the brewer; and here the great Dr. Johnson was a frequent visitor, indeed, for some time, an almost constant resident. It is now occupied, we believe, by a Jewish family. Looking across the common to the left, a splendid mass of oaks will be seen spread over the grounds of a cluster of villas on Bedford Hill, and a small avenue to the left leads to another villa.

Passing up the road to Streatham Church, and turning along the old

Brighton road, with splendid elm trees overshadowing it on both sides, and a good deal of park-like scenery on either hand, a walk of ten minutes will reveal Streatham Common, a beautiful grassy slope, environed with trees, and having a number of villas on the south side. Unlike the other commons we have noticed, this is almost entirely free from furze, unless it be near the top, and has lately been well drained. Except, however, a tuft of old elm trees around a pond at the bottom, the sward is wholly unfurnished with trees, and a few small groups, scattered tastefully along the sides, and more sparingly towards the top of the first sudden slope, are only wanting to make this one of the most pleasing of the smaller commons. From the summit of the first slope, and various parts of the upper common, and from what are called "the Duke's Fields," a little to the northward, the prospects obtained are not surpassed in any other part of the suburbs, and the elm trees, in particular, are extremely grand. Towards the bottom of this common, on the north side, is a pleasant villa, now the property of John Gray, Esq., but built by the last Earl of Coventry, and lived in by the Dowager Countess until her death. Near the site of the present villa, a palace, which was once a favourite with Queen Elizabeth, formerly stood; and some hints for improving the grounds attached to this villa will be found in Repton's "Sketches" on landscape gardening.

Mitcham Common, two miles west of Streatham, is an immense but by no means pleasing tract, being so completely unplanted, and having very few villas on its margins. It is, however, an admirable open plot, with good views of the Norwood and Streatham hills on one side, and prospects of other parts of the country on the south-west. We have also found it an interesting place for a botanizing ramble; *Genista anglica*, *Spiræa filipendula*, and many other by no means common plants, being plentifully found there. On the south side, too, it is bounded by the plantations which screen Beddington Park, once the magnificent seat of the Carew family, and still retained by a branch of the same, where some of the earliest specimens of exotics and of general gardening were formerly to be seen; and where, it is said, a cherry-tree was retained in fruit to a very late period of the year, by covering it up, in order to gratify and surprise Queen Elizabeth during a visit. Here, also, the first orange trees known in this country were grown in the open ground, and protected during winter. They were believed to have been raised from seeds of the earliest oranges imported into England by Sir Walter Raleigh. The severe frosts of 1739–40 entirely destroyed them. A trout stream (where there are some extraordinary fish), a glorious avenue of elms, and a few ancient trees in the park, are still interesting. Returning to Mitcham Common, let us hope that it will not be long before the very light expense and trouble of planting and inclosing some good clumps of trees in various parts of it will be incurred.

Scarcely more than two miles further westward lies the extensive and varied common of Wimbledon, including Putney Heath, which is not separated from it, and will yield a lengthened and most agreeable ramble. Indeed, this is much the largest common which the neighbourhood of London possesses, and furnishes a greater diversity of character. It must contain at least 1000 acres, and extends nearly to Kingston. On the north-east side it is bounded by Wimbledon Park, on the west by the villas and parks about Putney Heath and Roehampton, and, further on, by Richmond Park; while it is comparatively open on the south and south-west sides. For the most part, it is clothed with heath, which is short and small in the neighbourhood of Wimbledon Park, but strong and wild towards the vicinity of Richmond Park, where the ground becomes more rugged and broken, and the whole aspect is that of a wild moorland tract. Nearer Wimbledon village there is a smooth grass sward, and Putney Heath is a good deal covered with furze. There is an old telegraph station on Putney Heath.

Around the sides nearest Putney and Roehampton, the trees on the contiguous property keep the outline pretty well hidden and broken, and there are a few trees near Wimbledon. The rest of the common is, however, very bare, and the hard line of fencing round Wimbledon Park sadly wants covering in parts by masses of plantation. All the northern part of the common would, in fact, bear a great deal of planting; and the quantity of soil which is sold from it might well afford a small outlay for such an improvement. At the Kingston end, nothing would look so well, or thrive so freely, as masses of Scotch fir, which are admirably fitted for growing among wild and shaggy heather, and look most natural in such a position. From twenty to forty years ago Wimbledon Common was the scene of some of the most splendid military reviews, which are now rarely held there. Wimbledon peat is much celebrated among gardeners for heaths and orchids, and the great demand made for it causes it to be sold at a high price. It is a light-coloured and fibrous heath-mould, with no disposition to sourness or the retention of water, and having but little sand in it. Doubtless it is of first-rate quality for plant-culture.

Eastward of Barnes Church, the woody park which bounds the common, and over which a beautiful church spire near Kensington now rises, belongs to Barn Elms, the former residence of Mr. Cobbett, and more recently tenanted by the late Vice-Chancellor, Sir Lancelot Shadwell.

Public Gardens.—Our account of these will include such as belong to the country, and are open without fee to the public at certain periods, together with those which have been created by subscription or by public bodies, and are accessible to the members of those bodies, and to the general public through the introduction of such members. In respect to accommodation of this kind, London, with its extensive pleasure-grounds at Kensington, its noble Botanic Garden at Kew, the more mixed garden of the Horticultural Society at Chiswick, embracing general gardening of all sorts, and including exhibitions which have acquired a world-wide fame, the beautiful promenade and scientific Botanic Garden in the Regent's Park, likewise distinguished for its exhibitions, and the ancient Physic Garden at Chelsea;—with such a combination of attractive and useful gardens—not to mention those devoted more exclusively to zoological purposes—the metropolis has advantages with which few other large towns in Europe can at all compete.

Kensington Gardens lie close to London, and are, as before remarked, in immediate connection with Hyde Park, to which they form an excellent adjunct, of quite a distinct character. Intended only for the pedestrian, they are conspicuous for presenting one immense and almost continuous mass of shade, beneath which the public may freely enjoy a most luxurious summer ramble, which, but slightly varying in its principal features, and only traversed here and there by a broad open walk can be prolonged to a well-nigh indefinite extent.

The foundation of these gardens was laid by William III., but in his reign they did not occupy more than 26 acres. Queen Anne enlarged them to 56 acres, and had them laid out by her gardener, H. Wise, who afterwards became quite a celebrity in landscape gardening. Addison, in his *Spectator*, seems to have been delighted with those dawnings of the modern natural manner exhibited by this artist in his treatment of the old Kensington gravel-pits, thus converted into a portion of Kensington Gardens. In the time of George II., however, Queen Caroline extended these gardens to their present size, by taking nearly 300 acres out of Hyde Park, and having the whole laid out by Bridgman. At this period, also, the Serpentine was formed out of a series of ponds; and a large and somewhat circular basin of water was made in the neighbourhood of the palace, at the point from whence the principal avenues diverge. Kent was afterwards employed to alter these gardens, and encountered much ridicule by endeavouring to imitate nature so closely as to plant a number of dead trees.

Standing near the palace, and looking eastward, the leading features of the gardens present themselves, and consist in three principal openings or avenues, the best of which are terminated by Hyde Park, the intermediate and surrounding parts being filled in with dense masses of ancient trees. As the avenues are not sufficiently regular or contracted to acquire the dignity of art, and not expanded or broken enough to resemble nature, this scene is by no means impressive, like that at Hampton Court; and none of the vistas are at all happily terminated. But there is a massiveness about the trees, an appearance of age, and a total absence of anything that indicates the proximity of the town, which cannot fail to produce a striking effect on the observer, especially on a summer's day. The view down these avenues from the other side of the gardens, near the Serpentine, is much better, being terminated by Kensington Palace.

Of individual features, if we enter the gardens near the bridge over the Serpentine, and keep on the east side of the water, some noble old Spanish chestnut trees, which are well worthy of notice, will be found on the right, just within the gates. From this point to the head of the Serpentine, the walk beneath the fine old trees, with glimpses of the water and of the lawn and trees on the opposite bank, is one of the best parts of the gardens, the trees being more mature and more picturesquely disposed, and the ground less flat and tame, and the whole scene forming better and more varied combinations, than will be found anywhere else throughout the gardens.

Immediately in front of the palace is a small flower garden, of quaint design, and inclosed with a low iron railing; while between this and Kensington there are some rows of capital old elm trees, which are here very rich and fine. At the bottom of one of the short avenues which they compose is a lofty architectural alcove, of the reign of Queen Anne. Keeping along the southern margin of the gardens, and crossing the end of the broad walk (which is 50 feet in breadth), the new walk already mentioned will soon be reached, and here the gardening visitor will find a large number of the newer and rarer kinds of shrubs, all legibly named; and, though not yet of any remarkable size, all appear healthy and flourishing. It is in the introduction of these rarer plants that the idea of a "garden" is perhaps better sustained than in most of the other features of the place, which are more those of a park. The demand, indeed, for evergreens and undergrowth in these gardens is most urgent; and if (which we greatly doubt) there exists a well-founded objection to the use of shrubs and bushes in tufts, or as single plants, there certainly can be no reason why solitary specimens or varied groups of the many kinds of thorn, pyrus, mespilus, laburnum, pine and fir, evergreen oaks, hollies, yews, &c., should not be most extensively planted, and a large proportion of the younger and smaller trees in the densest parts cut away to make room for them. We recommend those who wish fully to appreciate Kensington Gardens, to go there on a hot and sunny, or dusty, or windy day, when they will experience, particularly in the northern parts, the pleasure of having a shady and sheltered retreat, free from all the dust, and dirt, and bustle of the busy thoroughfares. (See also p. 416.)

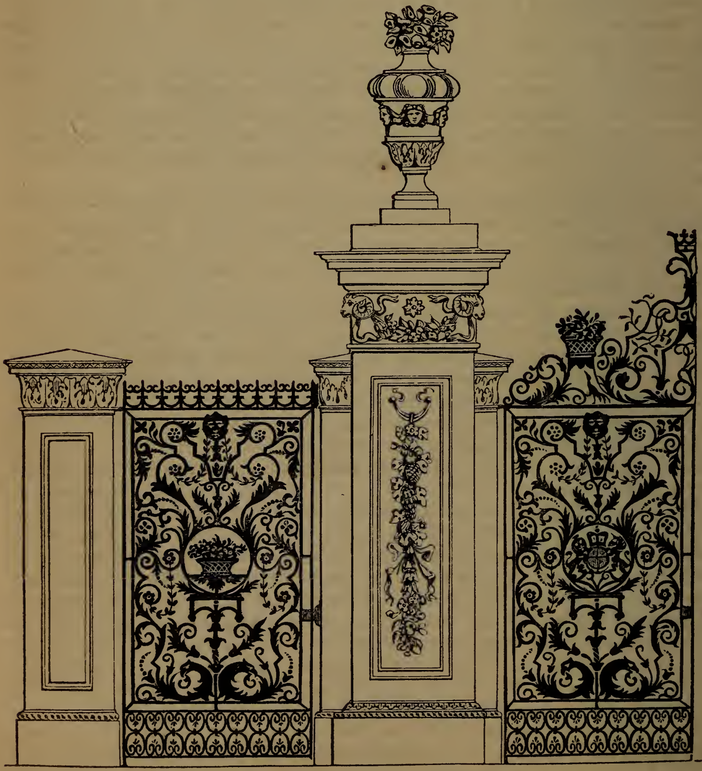
Kew Gardens.—The public gardens at Kew are at present divided into two portions, accessible by separate entrances and at different periods, and known severally as the "Botanic Gardens" and the "Pleasure Grounds." As some special reasons doubtless exist for keeping them apart, we can only express the hope that they will ere long be so far united as to be accessible from each other, that the public may thus have the additional privilege of taking a pleasant ramble and a scientific survey on the same day, and without the trouble of going round more than a quarter of a mile to reach the separate entrances. At present the Botanic Gardens are open every day, except Sundays, to respectable persons, from one o'clock till six; while the pleasure grounds can only be entered on Thursdays and Sundays, from Midsummer to Michaelmas.

An excellent guide to the Botanic Gardens at Kew has been prepared by the Director, Sir W. J. Hooker, and from this we shall glean only such particulars as a personal survey could hardly furnish; necessarily treating the subject somewhat lightly, because the gardens have already been so well described.

The history of these gardens may be soon told. They came into possession of the Royal Family through the Prince of Wales, father of George III., by whose princess both the pleasure grounds and exotic department were principally formed. In George III.'s reign, while Mr. W. Aiton was gardener, and under the auspices of Sir Joseph Banks, the gardens were greatly improved, and the extensive orangery, a large stove, and other buildings, erected from the designs of Sir W. Chambers. Until the death of George III., the collection of exotics and the number of plant-houses were continually on the increase, and the gardens had then acquired great celebrity. After this period, and until the year 1840, little or no progress was made, and the collection was chiefly remarkable for the great size and richness of many of its specimens. At that time, however, public attention having been drawn to the subject, and a commission of inquiry, headed by Dr. Lindley, having been formed to report on the state of these gardens, the Commissioners of Woods and Forests happily took them under their charge, and appointed Sir W. J. Hooker—so distinguished as a botanist—to be director, and Mr. John Smith—previously well known as a careful and intelligent cultivator, and long connected with Kew—as curator.

Under the management of these gentlemen, and by the aid of liberal parliamentary grants, the Botanic Gardens at Kew have undergone a complete transformation. By the addition of a large tract from the pleasure grounds, and by the destruction of all the old kitchen gardens, the space has been extended from 11 acres to 75 acres. An immense stove, with accompanying flower gardens, has been prepared; many new and superior plant-houses have been erected; a museum is founded; a pinetum planted; and, what is of great national importance, the whole has been thrown freely open to the public for their unrestricted instruction and enjoyment.

The entrance to Kew Gardens was formerly by a narrow alley from the side of Kew Green, along which the visitor proceeded, as it were by stealth. Now, however, a bold and highly appropriate entrance has been made at the end of Kew Green, where massive and enriched piers, gates, and open railing, extend across the end of the green. They are from the designs of Mr. Decimus Burton, and we have thought a sketch of part of them, here introduced, would be quite an ornament to our pages. Entering by these gates, *Taxodium sempervirens* and *Cryptomeria iaponica* will be noticed on the lawn to the right. They are described



ENTRANCE GATES TO KEW GARDENS.

as having stood three winters uninjured, and being plants which, from their novelty and the elegance of their forms, are much sought, it will be satisfactory to find them thus hardy. The *Taxodium*, we may mention, has even borne the much more northerly latitude of the neighbourhood of Liverpool, and is at present very flourishing.

As an accompaniment to the noble entrance gates, the large Architectural Conservatory on the right is very telling. It was brought here from Buckingham Palace. Though a good architectural feature, however, it was built at a period when the requirements of plants were little understood or little cared for; and hence it is far more heavy, and lofty, and dark than modern cultivators would approve. It is heated by an extraordinary number of small pipes, placed chiefly at the sides, by Mr. Perkins. This house, like all the others, is very conveniently numbered, and, from being nearest the gate, is known as No. 1. It contains a great many exceedingly fine Banksias, Dryandras, Grevilleas, Acacias, &c., and some huge and magnificent specimens of *Rhododendron arboreum.* The *Banksia solandra, Cunninghami, spinulosa,* and *latifolia,* with the *Dryandra formosa,* are particularly large and good. Nowhere in Britain—perhaps in Europe—is there anything at all equal to the plants of this tribe at Kew.

One of the finest views of the great stove is that obtained from about the end of the long walk, where it is seen in perspective. Regarded as a whole, it cannot be considered a great architectural feature. The semicircular heads of the two lofty side entrances, and the attic in the middle portion of the building, appear to us particularly exceptionable. But in the superior height and breadth of the central part, in the adaptation of the whole to its intended object, and in the mechanical arrangements for ventilation, and for painting, repairing, &c., there is much to admire. Looked at pictorially, the building suffers—as everything of the same size would—by being so entirely unsupported. At present it stands alone, in a comparatively naked plain, with not a tree anywhere near it, to enter into a composition with it. This extreme nakedness and rawness—which the transparency of the material of which it is composed renders all the more glaring—are among its most defective characteristics, pictorially viewed.

As regards the building itself, we are happy in being able to furnish the following account, for which we are indebted to the architect.

This large building is constructed wholly of iron and glass, on a stone basement, and was erected from the designs and under the superintendence of Mr. Decimus Burton.

The masonry was executed by Messrs. Grissell and Peto, and the rest of the works by Mr. Richard Turner, of Dublin, who commenced in 1844, and completed the whole in 1848.

The whole of the ribs and sash bars are of wrought iron, rolled to the forms required while in a soft state by means of powerful rolling-machines; the ribs are composed of several pieces welded together, and bent to the curves required. They exhibit a method of construction which the contractor, Mr. Turner, was, it is believed, the first to introduce, and in this building. The glass used in the building is the result of many experiments made by Mr. Robert Hunt, of the Museum of Economic Geology, on the actinism of the solar rays, by which he found that the peculiar tint of green here adopted prevents the scorching effect upon foliage complained of in houses glazed with white glass. The glass is of great thickness, to resist the effect of hail-storms.

The building contains upwards of 40,300 superficial feet of glass, or nearly an acre. The total length of the building is 362 feet 6 inches, the centre portion being 137 feet 6 inches long, and 100 feet wide, and 69 feet high to the top of the lanthorn light; the wings are each 112 feet 6 inches long, and 50 feet wide, and 33 feet high to the lanthorn.

A gallery runs round the centre portion of the house, at a height of 27 feet above the floor, from which fine views of the house and its beautiful inhabitants are obtained, and to which the ascent is by a light iron spiral staircase, inclosed by iron rods, which support climbing plants. The plants for which this house was erected, being natives of tropical countries, require that a heat of 80° should be maintained, while the external temperature is at 20° (Fahrenheit); this is effected by means of twelve boilers (Messrs. Burbidge and Healy's patent) placed in two vaults under the house, and upwards of 4¼ miles of iron pipes distributed under the floor and stone tables surrounding the house, giving a heating surface of about 28,000 superficial feet. As each of the boilers supplies a distinct set of pipes, the heat is readily and economically regulated by increasing or diminishing the number of boilers in use, and the house may be warmed in any particular portion, and climatised at pleasure. The heated air ascends through a perforated floor of cast-iron plates, supported on iron columns and girders, except where stone-paved paths interfere. The fuel to supply the furnaces is brought on a railway in a brick tunnel 550 feet in length, in which also are the smoke flues, which lead from the furnaces into one large vertical flue in a tower, which forms an ornamental object from various parts of the gardens.

The rain which falls on the Palm House roof is conveyed through the hollow pillars of support to a continuous tank under a stone shelf round the whole of the interior of the building, where its temperature is raised by its close contiguity to the heating pipes. This tank is capable of containing 42,000 gallons. Water also from the river Thames is supplied by means of a steam engine and pumps from an iron tank fixed at a height of 75 feet in the tower, from whence pipes distribute the water to the gallery and other parts of the house. The opportunity is thus afforded of throwing an artificial shower over the tops of the plants; the steam engine also forces water into all parts of the garden. Ample ventilation is provided by means of rolling sashes on the roofs, by vertical pivot sashes, and by the panels in the stone basement of the building; the whole of these ventilators, as well as the sashes, being readily opened and closed simultaneously by means of simple machinery. The cost of the structure, including the tunnel and tower, was about 33,000*l*.

Entering by the door at either end, the visitor will suddenly see before him one of the most extraordinary and perfect collections of tropical plants which is possessed by any garden in Europe. The wonderful variety of form in the foliage, and the extreme healthiness and richness of all the plants, are alike worthy of note. The mode of arranging the plants is to place a quantity of dwarf and showy ones on the narrow stages immediately under the glass, and all the rest along the centre, at the two ends, just leaving a sufficient path on either side of the house for visitors to walk comfortably on. All the plants are kept in tubs or pots, which stand on a kind of iron net-work or open grating with which the floor is covered, and through which the heated air ascends, as already explained. In the disposal of the plants, the highest are placed in the centre, and the lowest at the sides. This gives the whole a very formal appearance. In the central part, however, a more irregular and natural system of grouping has been followed, and with the happiest effect. This somewhat square middle space, with its broader and more varied masses of plants, just indicates the desirableness of making large houses of a squarer form than usual, and not so long and narrow. A house of the latter kind may be a very good repository for plants; but a broader one would be equally suitable, and would, at the same time, furnish the means of arranging the plants far more artistically, and with much better effect.

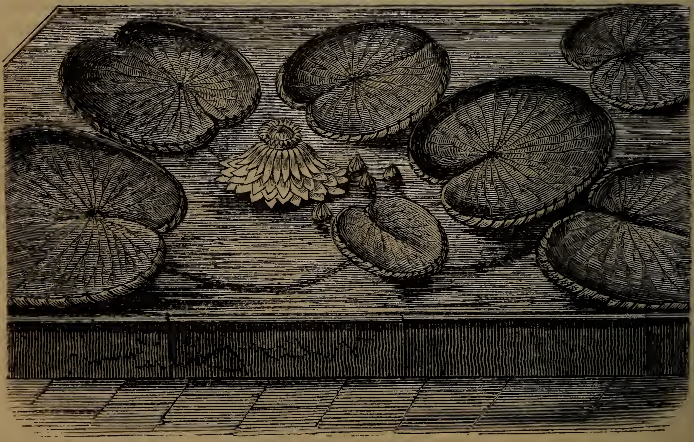
The plants brought together in this large stove are all more or less interesting, and many of them very deeply so. Fortunately the visitor to whom such things are not familiar will easily be able to gather the required information from the labels which are attached to each plant, and which generally give the common as well as scientific name by which they are known. Here, besides the stately palms, some of which are superlatively fine, are most of the rich tropical fruits, together with plants which produce spices, gums, or other articles known in commerce. Here, also, in a small basin on the eastern side of the house, is the Egyptian *Papyrus*, from which paper was first made, many of the plants mentioned in Scripture, the *Valisneria spiralis*, also in water, where it uncoils its curious stems in proportion to the depth of the water in which it is placed, the sugar-cane, the cocoa-nut palm, the bread-fruit tree, the chocolate tree, the coffee tree, the celebrated banyan tree, the sensitive plants, and a great multitude of equally interesting objects. As more conspicuous features, the palms are extremely striking, and the bananas are also fine, and fruit well. Many of the palms flower and fruit abundantly; and numerous other things, which are rarely seen elsewhere, except in a small state, regularly blossom and fruit here.

Among the more elegant and peculiar ornaments of this stove, the tree and other ferns will be sure to rank high in the visitor's esteem. The remarkable grace and beauty of their forms, and the tender green of their foliage, convey altogether a most pleasing and novel impression, such as scarcely anything else in the house produces. These ferns are especially to be admired when seen from the staircase or the gallery; and, indeed, the view of the whole collection from the gallery affords quite a new idea of tropical vegetation, and should by all means be obtained. In going up the winding stairs, the observer will also notice how finely a species of *Bauhinia*, with its singular and large two-lobed leaves, is covering the railing, and how well both it and *Passiflora quadrangularis* are spreading along the sides of the gallery. The climbing plants, indeed, both in this and other parts of the house, will, when they have acquired two or three years' more growth, immensely relieve and diversify the interior of the building. Towards the north end, we observed the singular club gourd, *Cucurbita maxima*, with its large pendulous club-shaped fruit. At present, the climbers at the sides of the house are grown in boxes beneath the stages, and trained up behind them; a more regular provision for placing them in a better situation appearing to have been overlooked in the erection of the house.

Walking round the outside of the arboretum, the visitor will at length arrive at the Temple of Minden, in the southern corner of the garden, and pursuing the same walk, will pass the great chimney tower, and along the eastern margin of the water. Here some of the finest front views of the great stove may be had, and from this point the artist has taken the beautiful picture shown in our frontispiece. A little farther, on a mound of considerable elevation, is the temple of Æolus, very happily placed, and picturesquely embosomed in trees. This mound, with its temple and trees, make a very good picture from many points. A short walk to the right (though not to the extreme right, which leads to the museum) will conduct to the British Garden, where those who are interested in the study of native plants, will find most of the indigenous species arranged under the heads of the natural orders. A little to the left is also the grass garden, in which the student of exotic pasture or other grasses may correct his knowledge of them, and derive any fresh information.

Near this spot are the houses numbered 3, 4, 5, and 6. The first of these is chiefly filled with Mesembryanthemums and similar plants. No. 4 is a propagating house, which is commonly kept fastened up, but may sometimes be entered, when a number of curious or novel things will be found in it. In No. 5 will be seen some very interesting young stove plants, the extraordinary *Platycerium grande* growing on a board fixed to the wall, the lemon grass, a very curious strong-growing grass (*Andropogon Schœnanthus*), with a delicious scent, like *Aloysia citriodora*, and, on the other front stage, nestling among mosses and Lycopodiums, a number of charming little plants, with pitcher-like leaves, variegated Tillandsias, and other rare and pleasing objects, some of them with variegated leaves. The plants on this stage include the beautiful little *Cephalotus follicularis*, many Sarracenias, the *Dionæa muscipula*, &c. The manner in which they are arranged and grown is most happy and appropriate ; and the admirer of pretty exotic plants will be sure to be much pleased with this group.

Entering No. 6, one of the great modern wonders of this garden reveals



VICTORIA LILY.

itself. This is the house dedicated to the superb new water lily, *Victoria regia*. These gardens have the honour of first raising this extraordinary plant from seed, and distributing it throughout the country. And although it first flowered at Chatsworth, and next at Syon House, the plant in this stove has since bloomed abundantly, and is in excellent health. Indeed, it seems already to require a larger cistern to grow it in, which, as this is one of the very few places where it can be seen by the public, we hope it will speedily receive. The plant is now well known to have been discovered by Mr. (now Sir R. H.) Schomburgk in British Guiana, in 1837. Drawings were afterwards exhibited, and seeds repeatedly brought over; but as these did not germinate, the idea of a plant with leaves from 5 to 6 feet across, and flowers 15 inches in diameter, began to be reckoned among those travellers' stories which men who go out of the beaten track are supposed to have a peculiar facility in concocting. At length, however, in 1849, Dr. Rodie, of Demerara, sent fresh seeds to the Kew Gardens, and as the plants from these have seeded profusely in this country, every one who will go to the expense of cultivating this vegetable phenomenon may easily obtain specimens. It appears to be a decided perennial; and is cultivated here in a high temperature, with a fresh supply of water slowly but constantly running through the tank. The leaves of the Kew plants have not yet reached the dimensions of those at Syon and Chatsworth, nor do they turn up quite so much at the edges: but there is every prospect of their speedily becoming in all respects equal. The flowers are large and very fragrant, of a creamy white, streaked and stained with deep pink towards the centre. A small sketch of both plant and flower is here furnished. Other aquatic plants are grown in the corners of the tank with the *Victoria*, and contribute much to improve its appearance. It has, in fact, rather a tame look unless aided by some taller-growing plants. When the leaves begin to turn up at the edges, however, it becomes more interesting; the extraordinary veins and spines on the under surface of the leaves, and their deep crimson colour on that side, imparting to it a much more striking character than when the upper surface alone is visible. In the *Nymphæa cœrulea*, and other allied plants which accompany the *Victoria* in this stove, the visitor will have an opportunity of comparing the giant proportions of this new water lily with the more common and familiar forms.

Leaving the Aquarium, and walking westward, the collection of grasses is nearly in front of us, and by keeping these on our left, we soon perceive the fine specimen of *Araucaria imbricata* on the lawn. This is the first plant of this favourite pine which was introduced into Britain, and was formerly protected with much care, but is now found perfectly hardy. Unlike all the other specimens in the country that we have seen, it has a bare stem to the height of 10 or 12 feet, and then expands into a broad, dense, hemispherical head. It is exceedingly curious and handsome, and has borne its large cones for the last four years. We noticed three of them on the plant last autumn. In Chili, where it is very abundant, the cones are said to reach the size of a child's head; and the individual seeds, which are about the size of acorns, though somewhat longer and less round, are eaten both for dessert and as articles of general food, being much like the Spanish chestnut in flavour.

In strong and admirable contrast with this singular Chili pine, the habit of which is so peculiarly rigid and bold, there is a lovely specimen of the weeping birch on the same lawn in the immediate neighbourhood. The extreme grace and elegance of this tree, whether with or without foliage, are particularly well set off by the strength and stiffness of its sturdy neighbour, and will not fail to command notice. Indeed, to the admirer of hardy trees, these are two of the most attractive plants in the garden.

The Greenhouse (No. 7) is a little to the westward of the spot just pointed out, and is very rich in the various kinds of New Zealand plants. The observer will, no doubt, be much struck with the great diversity of new and pleasing types which are here gathered together from one country. Nothing could be more beautiful than many of these are in point of form. The *Dacrydium cupressinum* is remarkably elegant, and there are fine plants of it here. Of the strange *Aralia crassifolia*, with its long, thick, and variegated leaves, there are also large plants ; *Thuya Doniana*, a delightful new Arbor vitæ, some novel species of *Phyllocladus*, and many allied plants, are likewise to be met with in this house, and of very unusual size. The lover of rare plants and beautiful forms will, in fact, have a great treat from the examination of the treasures in this greenhouse, and will, if we do not mistake, be tempted to linger long in their inspection. He must by no means omit to notice the rare antarctic beech, which is so dwarf in its habit as almost to make one suspect it had been imported from China, and the yet more interesting evergreen beech (*Fagus betuloides*), which is almost equally dwarf, and is remarkable, as Sir W. J. Hooker tells us, "for its being the most southern-growing tree in the world ; indeed, but little vegetation of any kind exists beyond it." Some large plants of *Magnolia fuscata*, well known for the peculiar scent of its flowers, will be found at the west end of the house, where *Sparmannia africana*—a plant that is more frequently found in a stove—flourishes and flowers most profusely ; and there is also "one of the oldest and noblest specimens of the original *Rhododendron arboreum* in Europe."

Not far from the western end of this house there is a basin of water containing aquatic plants, many of which will be found worthy of notice ; but the tussack grass of the Falkland Islands (*Dactylis cæspitosa*) is specially to be examined, because it is supposed likely, having stood out for three years, to become a valuable agricultural plant, on account of the great quantity and excellent quality of the herbage it produces.

A short distance from the back of No. 7, an old stove in two compartments (No. 8) may be entered, and will be found to contain, in the smaller or western part, a quantity of Tillandsias, Bromelias, &c., some of which grow naturally on trees like Orchids, and are very useful for suspending in stoves. Their flowers are often borne in long spikes, and are very showy. In the larger portion of this house, the members of the Aloe tribe are gathered together ; and among their quaint forms will be distinguished the more beautiful and pensile species of *Littæa*, and the taller and conspicuous *Fourcroya gigantea*. Two plants of this latter kind "had been," says Sir W. J. Hooker, "in the royal gardens, first of Hampton Court and then of Kew, probably from the earliest introduction of the species into Europe, upwards of a century ago (in 1731). On one and the same day, in the summer of 1844, each was seen to produce a flowering stem, which resembled a gigantic head of asparagus, and grew at first at the astonishing rate of 2 feet in the twenty-four hours. So precisely did the twin plants keep pace with each other, that at the very time it was found necessary to make an aperture in the glass roof of the house for the emission of one panicle of flowers (26 feet from the ground), a similar release was needed by the other. The rate of growth then most sensibly diminished; still, in two months, the flower-stalks had attained a height of 36 feet! The flowers were innumerable on the great panicles: they produced no seed, but were succeeded by thousands of young plants, springing from the topmost branches, and these continued growing for a long while after the death of the parent plants, both of which perished, apparently from exhaustion." Only young plants are, therefore, now to be seen in this collection.

Near the centre of this stove is a strange-looking plant, with a stem not unlike the common Elephant's foot (*Testudo elephantipes*), but bearing grass-like leaves. It is from America, as we were told, and is unknown. Two extraordinary specimens of the Old-man Cactus (*Cereus senilis*) should likewise be pointed out, on account of their unusual size. They are actually from 12 to 15 feet high; but clothed with the white bristly hair, which gives its common name to the plant, only at the summit. Judging from the ordinary rate of growth in this species, Sir William Hooker supposes these specimens may probably be as much as a thousand years old! If this be really the case,—and we know how careful Sir William is in putting forth such statements,—it gives a new and double significance to the name of the plant.

No. 9 is generally kept locked up, being a propagating house; but No. 10, which is a large house devoted to Australian plants, is one of the best examples of modern construction and arrangement in the gardens. It is a long building, ranging nearly north and south, with what is called a span roof, which is only just high enough to enable persons to walk beneath it comfortably. There is a narrow flat stage on each side for plants, and the rest of the collection is placed on the ground in the centre, a walk running along on each side of this central mass. In the middle of the building it expands to a much greater breadth, which produces a good deal of variety and character. This house is light and well glazed, and peculiarly adapted for the tribe of plants generally placed in it. It is kept gay during the summer by retaining in it those plants which happen to be in flower, and by the use of the more showy but transient ordinary decorations of green-houses. In the early part of spring, a very large proportion of the usual occupants of this house will be in flower. Perhaps April and May will be the best months. The collection of plants of this tribe is very perfect, and comprises most of the newest and best acquisitions, as well as those good old ornamental species which are now too seldom found elsewhere.

There is a large stove north of the Australian house, appropriated to orchids and ferns, of the former of which there is a very complete collection. This house (No. 11) is partly a new span-roofed building, and partly old, the division being only a glass one, and the doors being generally kept open between the two parts. The celebrated orchids of the late Duke of Bedford, and of the Rev. J. Clowes, of Manchester—both enthusiastic collectors—were added by gift to those previously existing here, and have greatly enriched the stock. On the whole, the orchids are well grown, and there are generally some of them in flower.

The ferns on the north side of the house are in the best health, and furnish many highly interesting examples. Towards the middle of the house, near the partition, are some large pitcher-plants, with their singular goblet-shaped leaves.

Another stove (No. 12) contains a miscellaneous collection of plants, and is kept at a lower temperature than the Orchid House. The Begonias, of which there is a great variety, and some of which are very lovely, make a conspicuous appearance here.

Two greenhouses (Nos. 13 and 14) are assigned to an additional portion of Australian plants and Cape heaths, the latter being grown in No. 13. In the house No. 14 are many excellent specimens. In the neighbourhood of these houses there is a bed of Cape heaths planted in the open ground, and apparently protected during winter ; and there are also several frames around this cluster of houses, in which will be found numerous plants that will afford interest to the more curious and inquiring cultivator.

The only other houses to which we shall refer are a stove (No. 16) at the back of the Museum, and the Cactus House, No. 19. Both of these are situated in what was the old kitchen garden, near the road from Kew to Richmond. In No. 16 are seemingly grown those rich and delicate tropical plants which will not thrive without a moist bottom heat. The nutmeg, clove, mangosteen, mahogany tree, Assam tea, the cow tree, the famed upas tree, and the Paraguay tea, are among the many plants which deserve to be examined here. The highly tropical forms of Cannas, Curcumas, Alpinias, &c., here abound. In this house, therefore, some time may very agreeably be spent ; and the temperature, though high, is sufficiently humid to render it easily endurable.

No. 19, the Cactus House, is one of those best worth visiting, both because it contains a very first-rate collection, and because this is one of the very few houses in which any attempt at what we would call natural treatment or effect has been made. Let us add, that what is here done is with the happiest results. A walk passes through nearly the centre of the house on a raised level, between which and the front path there is a low pit, filled with the different kinds of *Echinocactus*, *Mammillaria*, &c. The specimens are planted out or plunged in the pots, among irregular masses of fused brick, so as to appear to be growing among small loose rocks. And though the material used is none of the most pleasing, and the forms into which it is thrown might with advantage be greatly varied on the surface, so as to take a less flat and more natural character, yet we cannot but point to the practice as a very decided step in the right direction, which we hope ere long to see extended to other departments and houses in these gardens, and executed with spirit. Plants of Lycopodium are growing here and there among the Cacti, and enliven the whole mass considerably; though they will undoubtedly require watching and restraint to prevent them from spreading too far, or producing too much moisture. It is difficult to conceive, without seeing them, what a change this system of treatment produces in the appearance of the tribe, and how well they seem to thrive under it. Of course the beds in which they are planted are most thoroughly drained, being filled with loose brick rubbish, or some similar material. Among the plants occupying this pit is the great Visnaga, of which the spines are used for tooth-picks in Mexico, from whence it derives its name. "The weight of this single specimen," observes Sir W. J. Hooker, "is 713 lbs., and it is in the most perfect health and vigour. It was drawn by oxen from the interior of Mexico (San Luis Potosi) to the coast for shipment, and arrived in excellent condition." Another specimen which weighed a ton was received at the same time, and appeared likely to grow, but it afterwards decayed.

Between the central path of this house and the back, the taller Opuntias, Euphorbias, species of Cereus, &c., are arranged, and the kinds of Stapelia, &c., occupy the front stage. As is well known, many of the larger forms bear the most splendid flowers. The cochineal insect, from which the brilliant dye called cochineal is obtained, may here be seen in abundance on the *Opuntia coccinilifera.* It is a small whitish mealy bug, and is so valuable in commerce, that Humboldt states there is exported from Mexico alone as much cochineal as yields annually the enormous sum of half a million sterling.

Many of the smaller members of this family here flower profusely, and produce very pretty blossoms, while some have showy fruit. From several of the Euphorbias a deadly poison is extracted, which is used on arrows and other weapons in South Africa. In this house, also, there is a small collection of plants from Africa, obtained near Ichaboe, where the great beds of guano exist. "More than one of them are remarkable" (we quote again from the 'Guide' to Kew Gardens) "for exuding gum resin, and that marked *Monsonia Burmannii* (the old *Geranium spinosum* of Linnæus) for becoming when dead a mass of gum resin, of which the quantity is so great in these burning sands, that it has been imported, in the hope of its proving valuable as an article of commerce. This particular plant on its arrival, and for four years, had been, to all appearance, perfectly dead, and more than half converted into a gum resinous substance, exhibiting only a few crooked lifeless-looking branches. Suddenly, in the spring of 1850, it has put forth leaves, and is full of life and vigour."

The Museum is a recent addition to these gardens, and by no means the least attractive or valuable one. At present it is confessedly but the beginning of what will, no doubt, some day include everything that such a depository could be wished to contain, not even omitting a herbarium. Even now, half an hour or an hour may be most amusingly and instructively spent in examining the specimens of the plants which produce hemp, flax, straws, vessels, caoutchouc, gutta-percha, and a variety of other things, with the numberless products manufactured from these, and articles illustrative of the different processes of manufacture. Here are also the plants which produce paper, and specimens of different papers, the opium plant, and the implements used in the preparation of the opium of commerce, sections of different woods, specimens of woods and barks, a great many sorts of seeds and seed vessels, specimens of plants used in medicine, or for chemical or other useful purposes, spices and dried fruits of many kinds, and an almost infinite variety of other vegetable products, mostly of a useful character. The museum is adorned, likewise, with models in wax of the *Victoria regia* and other flowers; and with many drawings of the *Victoria*, the *Rafflesia Arnoldi*, and a multitude of other plants. Perhaps the article which is most perfectly illustrated—and to which public attention has been a good deal excited of late—is the gutta-percha, of which there are numerous specimens exhibiting its applicability to a number of ornamental objects.

If Thursday be chosen for visiting Kew, parties who have thoroughly looked through the Botanic Gardens may quietly stroll through the *pleasure grounds*, which are not closed till dusk, and which will not demand a lengthened survey. They can be entered at either of the two gates on the Richmond Road, or by one situated at the side of the Thames. As the latter is the one usually chosen by persons going from the Botanic Gardens, we will suppose the visitor to start from that point.

Allowing for the abstractions which have been made to enlarge the Botanic Gardens, these pleasure grounds now contain nearly 130 acres. Just before the gate is reached, two or three very large elms will be noticed, one of which is said to have been planted by Queen Elizabeth, but was blown down about eight years ago. The stump is still preserved. It may be well also to point out the long island in the river, opposite Kew Palace, where a plantation of trees was happily made to cover the town of Brentford, which it certainly does in the summer season, while at the same time it adds to the beauty of the river at this point, and would be a still finer object were there not so many common willows upon it. These last, growing up rapidly to one uniform height, and having all the same common-looking character, greatly detract from the appearance of the island, which might be much improved by a sprinkling of lower trees among them. Nothing would look better than alders of various kinds in such a position, and they are very fast growing. A few deciduous cypresses, also, which would flourish here, might greatly relieve the appearance.

Horticultural Society's Gardens.—Situated at Turnham Green, which is better known from being in Chiswick parish, these gardens—taking in a far wider range of objects than the Botanic Gardens at Kew—have acquired great celebrity from their having been established at a period when gardening was in a very low condition in this country, and from having been the principal means of raising it to its present extraordinary and yet rapidly-improving state.

Founded in 1802, and incorporated by charter in 1808, the Horticultural Society issued its first volume of "Transactions" in 1812, and in 1822 arranged with the Duke of Devonshire for the lease of 33 acres of land at Chiswick, in order to form a garden. Previously to this, a small piece of ground had been temporarily occupied by them at Brompton. In 1824, the orchard and great part of the garden was planted and arranged, and in 1825 the arboretum was completed. During all this time, T. A. Knight, Esq., so widely known by his valuable experiments and writings on horticultural matters, was the president of the Society, having largely contributed to its establishment, and, by his great exertions, laid the foundation of its subsequent usefulness. Mr. Joseph Sabine was then, also, the honorary secretary, and had much of the practical management of the Society's affairs.

Acting upon the comparatively dormant horticultural mind, this Society, besides establishing frequent meetings in its rooms at Regent Street, at which superior gardening products were exhibited, and the cultivators stimulated by prizes, invited communications from all parties on subjects relating to horticulture, and published these in a combined form in their "Transactions." They also commenced a gardening library, which has been subsequently so much augmented as to become a most valuable repository of all that relates to the art, and which is readily accessible to respectable persons. When the garden was formed, moreover, they employed it for cultivating and testing all the known kinds of fruits and vegetables, trees and flowers, and trying various methods of treatment, and practically experimenting on every new sort of machinery or appliance used in the various branches of horticulture. The collection of fruits, vegetables, and ornamental plants thus became a living cyclopædia of reference as to every object of value to the cultivator; and, during successive seasons, every different mode of managing the numerous products of a garden has been tried.

At the same time, by opening communications, and establishing exchanges, with the various public, commercial, and private establishments throughout our own country and the world, the Society has been enabled to gather together, at various times, a prodigious mass of new and valuable plants as well as information; the former of which it has distributed to its members through the medium of cuttings, &c., and the latter by means of its "Transactions."

Nor has it been at all inactive in adopting more direct methods of obtaining new and interesting objects from previously unexplored resources. At different periods since its origin, it has sent out numerous collectors, specially commissioned to search for novel and useful plants in tracts before untrodden, save by the wild beast or the savage, and the aggregate of such acquisitions is now quite startling. There are, in fact, but few of our most prized modern ornamental plants which the Society has not, in some way, been the means of introducing, or of making more generally available. The list of its own exclusive collectors is now a considerable one; and among them the name of the unfortunate Douglas will long live as having introduced such excellent hardy plants as *Ribes sanguineum*, *Berberis aquifolium*, *Spiræa ariæfolia*, *Gaultheria shallon*, *Garrya elliptica*, *Acer macrophyllum*, several first-rate species of *Pinus* and *Abies*, *Nemophila insignis*, and many other annuals, *Mimulus moschatus* and *cardinalis*, some showy Lupines, and, in short, above 200 hardy plants, all of which are more or less ornamental. The more recent acquisitions, also, of Hartweg in Mexico and the neighbouring countries, and Fortune in China, are of great value, and will contribute much, in the present and future ages, to do honour to the Horticultural Society.

In addition to the shows periodically held at Regent Street, the Society began an exhibition—of fruits only—at the gardens, in the month of June, 1831; and this was extended to flowering plants, and held in the months of May, June, and July, in the year 1833. These exhibitions have since been regularly continued; and, by the amount of the prizes offered, and the emulation which is excited among cultivators through having their objects examined by such multitudes of the higher class of visitors, have tended, almost more than any other means, to bring plant cultivation in England to its present truly wonderful state. Those who have the good fortune to witness one or more of these displays, when, besides the extraordinary richness of the plants and flowers, all the beauty and fashion of the metropolis are quietly promenading the gardens, and the best military bands are filling the air with delicious music, will certainly form a very exalted notion of what the Horticultural Society has done for gardening.

The exhibitions of the Society are still kept up in the gardens for one day in each of the three months above named, and for several years the Duke of Devonshire, who has been president of the Society ever since the death of Mr. Knight, has very handsomely allowed his beautiful grounds at Chiswick, which adjoin the Horticultural Gardens, to be thrown open to those who attend the July exhibition. For the year 1851, we are informed, the Society has made special provision for gratifying the visitors to the metropolis, by allowing Mr. Hosea Waterer, of Knap Hill, to exhibit his magnificent collection of rhododendrons and other American plants; and there is also, we believe, to be a special show of fruit, with other novel features, on some day in the month of August, hereafter to be announced.

The fruit department of the gardens of the Society was formed the earliest, and constituted originally one of the leading features of the establishment. It is now, and has been for the last twenty-four years, under the superintendence of Mr. Thompson, whose knowledge of the fruits grown in this country, and skill in their cultivation, is justly considered unrivalled. If any proof were needed of the advantage of confining one man's attention to one department, in order to secure the highest knowledge and excellence, Mr. Thompson would supply that proof to demonstration. Earnestly devoted to his main pursuit, there is not a variety of fruit, or peculiarity in their habit, or delicate distinction of flavour, or aptitude for receiving any particular treatment, with which he is not thoroughly familiar.

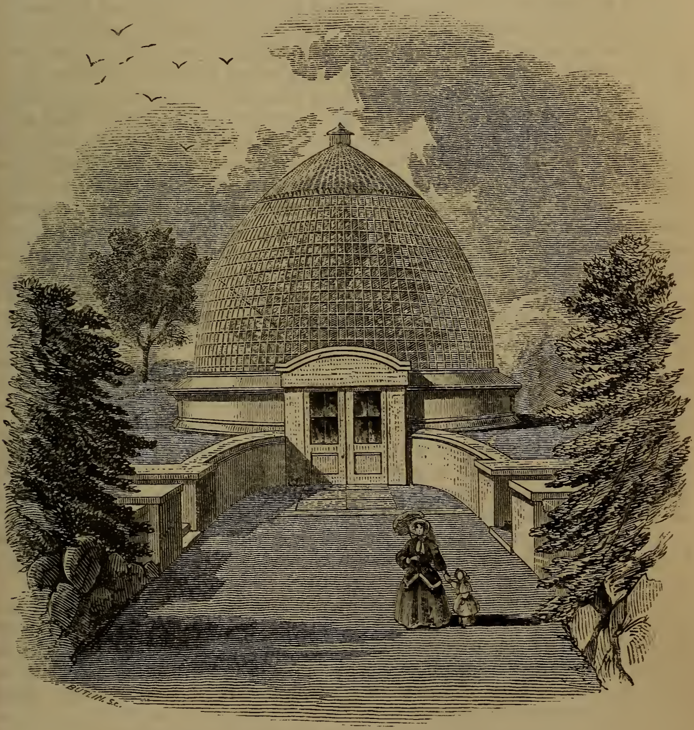
At an earlier period, when this garden was first formed, its fruit department embraced the culture of such things as pine apples, and the *forcing* of peaches, figs, cherries, &c., with the growth of mushrooms and such like objects. Now, however, nothing of this kind is attempted beyond trying a few grapes, and proving melons, cucumbers, or similar plants. After having given several years to ordinary forcing, and shown some of the best examples of it, the experiment was found too expensive, and the modes of cultivation, or the sorts of fruit used in that way, changed too little to warrant a large machinery being kept up solely to test them. The existing fruit department is therefore confined almost wholly to hardy things.

There is a large quarter of old apple and pear trees, occupying an acre and a half. A quarter newly planted with pears, to be trained as espaliers, contains about half an acre. Another quarter, of about a third of an acre, is appropriated to select plums; and one of the same extent to cherries. There is also a plot, of similar dimensions, just planted with general fruits, in which every known method of training is to be exemplified. A trial ground, for new fruits of every kind, contains three-quarters of an acre; and there is a large border for the newest and best strawberries, with a border for apple trees all round the orchard.

The fruit room is large, and situated at the back of a peach wall. It has a north-westerly aspect, and is entered through another small room, so as never to admit the external air when it is wished to be excluded. It is generally kept almost dark, and well ventilated, the windows being matted up in winter just to keep out frost, and no fire heat employed.

The fruit is laid on wooden shelves, arranged in tiers, and formed of strips of wood about three inches wide, with small openings between each piece. The more valuable sorts of pear are wrapped individually in soft paper. Nothing could be more simple than the arrangement of this fruit room, the great point which requires attention being to see that it is just sufficiently ventilated to carry off the moisture which exhales from the fruit, without drying the air so much as to cause any of the articles to shrivel. Almost total darkness is also maintained.

Two or three years back, the Society rendered great service to horticulture and agriculture, by commissioning Mr. E. Solly, jun., to carry out a series of experiments in the garden, on the efficacy of the different modern manures; and that gentleman also delivered a course of lectures on the subject at the Society's rooms in Regent Street.



CONSERVATORY, HORTICULTURAL GARDENS, CHISWICK.

Approaching the large conservatory at its western end, it exhibits a very light and elegant exterior; but, in conjunction we believe with most persons who have seen it, we cannot admire the mode in which the entrance is there effected. The walk is made to descend gradually for some distance, so as to get the door beneath the plinth of the house, and there are steps to the right and left after entering, to conduct to the level of the floor of the house. This is essentially awkward and inconvenient, and gives the impression, from the outside, of going down into the house, instead of rising to it as would be desirable. So far is this plan from improving the elevation, too, that we cannot but think a bold square-headed door, with proper mouldings, would be rather an advantage to the appearance of the building at this end.

Entering this conservatory, which is remarkably neat, and has, if anything, too much light for the plants—a fault which, if it exists anywhere, is peculiarly modern, and arises out of the excess of a virtue—the character of the house, and the arrangement of the plants in it, will be almost sure to please. It has a curvilinear roof, formed entirely of light iron, and glazed with patent sheet glass. The present portion, which is one wing of the proposed building, intended to be 500 ft. long, and to have an octagonal centre compartment, was erected by Messrs. D. and E. Bailey, of Holborn, in 1838, from the designs of Alfred Ainger, Esq. It stands in a direction nearly east and west, on a raised platform, and is 180 ft. long, by 27 ft. high, and about 27 ft. in breadth. The eastern end, which is upright, is only temporary, till the other parts are added. The glazing will be observed to be beautifully done, and all the work about the building is nicely finished. By the ventilators in the sides (beneath the stages), the air is caused first to pass over a gutter of water, collected from the rain which falls on the roof, and it thus becomes partially charged with moisture. It afterwards passes over the hot-water pipes; and in this way, whenever heat and air are required at the same time, becomes slightly warmed before it reaches the plants.

Within the house, there are narrow stages along the side walls, and a path on each side of a central bed. Small and showy flowering plants are generally kept on the stages, and on the north side there is a limited collection of the cactus tribe, with Echeverias and other succulents. It is found that the strong light is rather prejudicial to plants on the southern stage, as it dries them up so quickly, and causes them to require frequent waterings. It may here be observed, too, that the leaves of the larger plants in the middle of the house frequently become burnt opposite a particular angle of the glass, and acquire numerous brown blotches; but those plants which have woolly leaves do not appear to suffer. It is only the leaves which have a smooth surface that are at all affected, and these simply, as we have said, where they happen to come within range of the rays which pass through a certain curve of the glass.

Down the centre of this conservatory is a bed of soil, in which the bulk of the plants are inserted, without pots. Here they grow most luxuriantly, and produce magnificent specimens, causing one greatly to regret that, in consequence of the rapidity of their progress, they have, in a few years, either to lose their leading shoots, or be removed. Even with this drawback, however, the effect they produce in giving an air of picturesque wildness and resemblance to nature, is so good and so very desirable, that it strongly inclines us to prefer sacrificing a few plants every year in order to attain this extreme healthiness, variety, and vigour. By a very little contrivance, a succession of plants, in different parts of the house, may be kept advancing, so as never to render the practice of this system productive of bareness and feebleness.

There are so many plants, moreover, which will always keep within moderate limits, that are peculiarly fitted for planting out in this way.

Those plants which have most arrested our notice in this conservatory are the tea-scented roses placed here and there along the sides of the bed, and which thrive here in great splendour; the Hedychiums on the northern side, near the western end, which flourish and flower superbly; the Brugmansias, which are admirable conservatory plants, but want a little autumn pruning; the charming Hydrangea-like *Luculia gratissima*, which seems most congenially placed on the north side, and blooms profusely in November and December; *Polygala grandiflora*, quite a tree; *Acacia oxycedrus*, a variety of *A. pulchella*, and other species of the genus, singularly elegant when in flower; *Cestrum aurantiacum*, very large, and equally handsome, during autumn, whether in a large or small state, for its bright orange flowers; *Araucaria brasiliensis*, producing cones; the large Altingias at the eastern end, which one laments to see necessarily decapitated; and, without further multiplying examples, the many elegant climbers, especially *Kennedya* (*Hardenbergia*) *macrophylla*, which scrambles up some wires to a great height, and forms an immense mass of the richest foliage and flowers in summer, looking like the splendid drapery to some luxurious Eastern scene. In the wild and free manner in which this and other climbers are left to dangle about, there is much of nature, and at the same time indications of the highest art; for it is one of the last attainments of art to realize anything like a natural appearance. We shall be much mistaken if the visitor of taste is not as highly pleased with the *Kennedya* we have mentioned as with any other thing, however rare, in the whole garden.

With the long walk previously existing opposite the main entrance, and which has now been finished by an alcove brought from another part of the garden, and the pediment of which is unluckily much wider than the vista through which it is seen, the arboretum has three bold straight walks on its eastern, northern, and southern sides. There is also a walk, though of less consequence, along the western margin. The space by the sides of the northern walk, and between it and the boundary wall, however, is the most interesting part of the arboretum.

On the conservative wall along this side of the garden, there is a large collection of such plants as are naturally climbers, and either hardy or nearly so, together with those tender shrubs which, requiring the protection of a wall with a southerly aspect, will yet bear some little amount of training.

The plan adopted for sheltering the plants on this wall is to have a narrow border, not three feet wide, with a row of rude pillars along the front, and a light frame-work of wood at the top to support a thatch which is applied during winter. This thatch, which is only just sufficient to cover the border, at once turns off all the wet, and checks radiation, while it does not materially interfere with the action of light and air on the plants.

In the area which we supposed the visitor first to enter, there is an orchid house, in which the pots containing the plants are placed on a thin bed of gravel, to keep them moist without making them too damp. This house is kept pretty hot, and rather above the average for moisture, and the plants look very healthy. A large specimen of the lovely *Phalœnopsis amabilis* is nearly always in flower. A stove near this house, with a broad span roof, which is entered rather uncomfortably by two or three descending steps, contains a mixed collection of stove plants, with climbers trained to trellises in pots, and many pretty little plants of rare kinds of *Begonia*, *Achimenes*, *Gloxinia*, *Centradenia*, *Columnea*, &c.

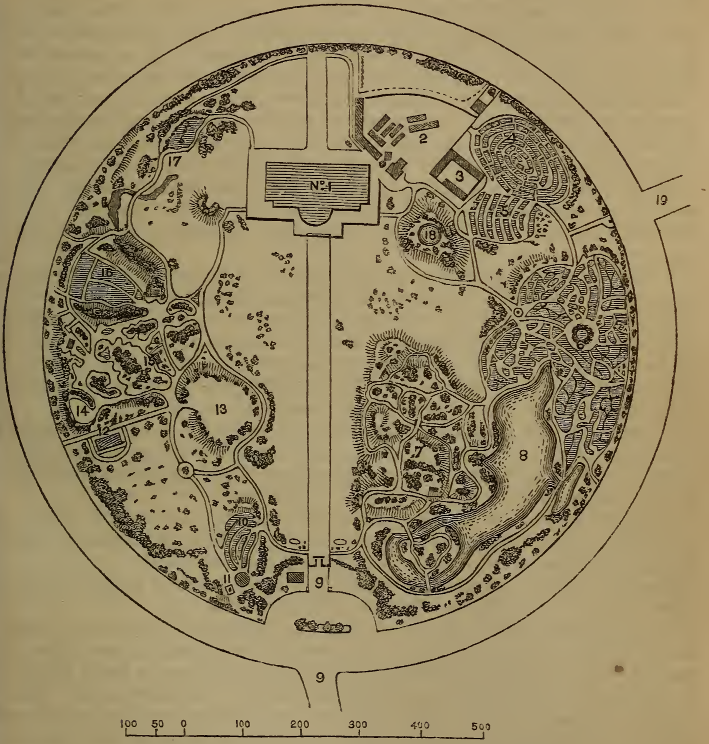
Another house used as a stove (formerly a vinery) has many newer things in it, and is better deserving of a visit by those who are in search of novelties. The gigantic specimen of *Lœlia superbiens*, which blooms freely every year, is usually kept in this house; as is likewise a very large plant of the old *Dendrobium speciosum*, which few persons can flower, but which here produces an immense number of blossoms, though not every season. A low span-roofed greenhouse, with a path in the centre, and broad flat stages, the glass coming down nearly to the level of the stages at the side walls, is described as a very useful house, with a particularly simple heating apparatus, which is capable of doing a good deal of work at a light expense, and with little trouble. The boiler used is called the Exeter drum boiler, and supplied by Mr. Jervis, of Exeter. The upper part of the boiler is a sort of hemisphere, connected with the lower part by upright pipes, and the fire is in the centre of the lower part, as it is in most of the conical boilers. Shewen's boilers are also used in these gardens, with the happiest results.

Another span-roofed greenhouse, of more pretensions, and ranging north and south, stands near the one last mentioned, and was presented by Messrs. Hartley & Co., of Sunderland, to exhibit the application of their patent rough glass. It is a neat and elegant house, and the large panes of glass give it a very superior appearance.

A little way off, in the other direction, a plain span-roofed pit, with a path down the centre, has just been completed at a trifling expense. It is entered by two descending steps, and, without being much (if any) dearer than those pits which are only accessible from without, it enables the gardener to get into it in all weathers, for the purpose of watering and for other tendance, without exposing the plants to rains or cold, and at a much smaller sacrifice of convenience.

The experimental ground, in which these pits occur, is used for raising new annuals, for testing different kinds of produce, for examining the properties and value of agricultural plants, for trying experiments with manures, for gourds, vegetable marrows, general flowers, or any object or thing which happens to require examining, and for which there is not a regular place provided elsewhere. And while thus referring to experiments, we may state that Mr. Gordon raised a very good hybrid variety of *Anemone japonica* here, which found its way into many of the gardens about London last year, and, like the original species, is much esteemed as a summer bedding plant.

Returning through the arboretum to the principal entrance, we will just remark that access to the gardens can be easily obtained through the order of a Fellow of the Society; and gardeners, we believe, are always admitted on application at the Turnham Green Gate. Candidates for membership must obtain the introduction of three Fellows of the Society, and the yearly subscription is four guineas. Tickets for admission to the gardens on fête days can be had through the medium of Fellows of the Society; or respectable parties may apply to the Vice-Secretary, 21, Regent Street. The exhibitions in Regent Street are open to any one introduced by a member, and are held once or twice in every month, on Tuesdays. The days on which the Garden Exhibitions are held are always duly advertised in the newspapers. We must not omit to add that the Society distributes the plants which are introduced through its means with the greatest liberality, as well to nurserymen as to its unprofessional members, and that grafts of the best kinds of fruits are likewise freely distributed.



GROUND PLAN OF BOTANIC GARDENS, REGENT'S PARK.

Royal Botanic Gardens, Regent's Park.—When these gardens were first projected, those at Kew were in a wretched condition, and difficult of access, while the Horticultural Gardens were formed and conducted on a much wider basis than was here contemplated, and did not embrace at all many of the objects which the founders of these sought to compass. It is well known that the Horticultural Society never attempted to establish a botanical collection, or, indeed, any collection at all, except of hardy shrubs and trees, and fruits. There was, therefore, a legitimate field open to this Botanic Society for the formation of a botanical collection, and the site which they chose for their gardens would necessarily, by its proximity to the better parts of London, give them another claim to support. The success with which their exertions have been crowned, notwithstanding the great improvements which have been effected at Kew, shows at once the reasonableness of their plan, and the deep hold which gardening has taken of the English mind; for it now appears that there is ample room for this new claimant to patronage, without detriment to the older institutions.

The Royal Botanic Society was incorporated by Charter in 1839, and the garden commenced in 1840. This garden stands on the site of the Inner Circle, Regent's Park; a spot said to have been reserved for a palace by George IV. It was long occupied as a nursery-garden by Mr. Jenkins, and derived the advantage from this circumstance of having a number of ornamental trees, some of which are of a respectable size, already existing upon it. The many specimens of Weeping Ash, the large Weeping Elms, and the numerous more common trees on the south-western side of the gardens, are among the older tenants of the place. Some first-rate specimens of *Andromeda floribunda*, too, for which Jenkins's nursery was celebrated, still exist, and are in the American garden.

Although situated, as it were, in London, this garden does not suffer much from the smoke incident to the metropolis, being on the north-western side of it, and in a not very populous, though highly aristocratic district. Comprising only about 18 acres, too, this place, by being in the midst of Regent's Park, and having the ground falling away from it on most sides, while conspicuous hills and swells rise in the distance, is made, by a wise treatment of the boundary, to appear at least twice as large as it really is; for, from the middle of the garden, the fences are scarcely at all seen, and the plantations are now beginning to blend with those outside, and with the surrounding country, so that a great indefiniteness of view is procured.

In the year 1840, before the garden was begun, the Society appointed Mr. Robert Marnock, the designer and former curator of the Sheffield Botanic Gardens, to the curatorship of this establishment; and from the plans, and under the direction of this gentleman, assisted by Mr. Decimus Burton as architect, the garden has since been laid out.

In a landscape point of view, we may safely affirm that Mr. Marnock has been particularly happy in the arrangement and planting of this garden. As a whole, the avowedly ornamental parts are probably superior to anything of the kind in the neighbourhood of the metropolis. Much has been attempted, especially in the variation of the surface of the ground; and almost all that has been proposed is fully and well achieved. We would particularly point out the clever manner in which the boundary fence is got rid of on the northern and north-western sides, as seen from the middle of the garden; the beautiful changes in the surface of the ground, and the grouping of the masses of plants, in the same quarter; the artistic manner in which the rockery is formed, out of such bad materials, and the picturesque disposal of the plants upon it; and the treatment of the large mound, from which so many and such excellent views of the garden and country are obtained. We might also refer to the singularly delightful arrangement of the American and Coniferous plants, brought last year for exhibition, in which a great deal of the highest taste was displayed, and which we understand has now been re-arranged in a still more interesting manner.

Entering by the principal gate (9 on the ground plan), not far from

York Gate, the first thing deserving notice is the very agreeable and effective manner in which the entrance is screened from the gardens, and the gardens from the public gaze. This is not done by large close gates and heavy masonry, but by a living screen of ivy, planted in boxes, and supported by an invisible fence. There are, in fact, two screens; one close to the outside fence, opposite the centre of the principal walk, and having an entrance gate on either side of it; and the other several feet further in, extending across the sides of the walk, and only leaving an opening in the centre. By keeping the ivy in boxes, it does not interfere with the continuity of the gravel walk, and has a neater appearance, and can, we suppose, be taken away altogether, if required. At any rate, it has a temporary look, which is of some consequence to the effect. These screens are from 6 to 8 ft. high. In a small lodge at the side, visitors enter their names, and produce the orders of Fellows of the Society, which are necessary for seeing the gardens. Gardeners are admitted by a gate on the east side of the Circle, nearly opposite the road which crosses the Park from the neighbourhood of the Colosseum.

After passing through the screen we have thus described, a broad, bold walk is entered upon, at the end of which, on a slightly-raised platform, is that portion of the great conservatory which the Society has already been able to complete. But before advancing to an examination of that building, we would recommend the visitor to turn to the right, and, taking the various features of the garden in regular course, accomplish the entire circuit of it without having to travel over the same ground twice.

Adopting this route, the ascent of the large mound (7) will be one of the first things that commands attention. And directly the visitor gets upon these walks, he will perceive that an entire change of character has been contemplated. Instead of the highly-artificial features of the broad walk opposite the entrance, we are here introduced to an obvious imitation of nature. The surface of the ground is kept rough, and covered only with undressed grass,—such, we mean, as is only occasionally and not regularly mown; the direction of the walks is irregular, or brokenly zigzag, and their sides ragged; the plants and trees are mostly of a wild character, such as furze, broom, ivy, privet, clematis, thorns, mountain ash, &c., and these are clustered together in tangled masses. Such a style is too seldom thought of or well carried out to render a fair specimen of it otherwise than agreeable, or indicative of real taste. But we must be permitted altogether to doubt its fitness for this locality. In the very midst of a highly-cultivated scene, which is overlooked at almost every step, and adjoining a compartment in which the most formal systematic arrangement is adopted, in beds, and almost within the limits of the great metropolis itself, such an introduction of the rougher and less cultivated features of nature is assuredly to be deprecated. It cannot be too strongly insisted on, that art is not a thing to be ashamed of in gardening, although, in general, it should in no way be obtruded. And whenever the rougher characteristics of nature are brought into a polished garden, there is just as much necessity for keeping them secluded and by themselves, as there is for isolating the conspicuous evidences of art in one of Nature's wildest scenes.

Several platforms on the face of the mound, and especially one at the summit, afford the most beautiful views of Regent's Park and its villas, Primrose and other neighbouring hills, and the more distant country. On a clear day, with the wind south-west, west, or north-west, these landscapes are truly delightful. There is a mixture of wood, grass, mansion, and general undulation, which is singularly refreshing so near London, and which abundantly exhibits the foresight that has been displayed in the formation of this mound. Unquestionably, when the atmosphere is at all favourable, the ascent of the mound is one of the greatest attractions of the garden to a lover of landscape beauties. The classic villa of the Marquis of Hertford in the Park, is a very conspicuous object in the view.

Descending the mound on its eastern side, a small lake (8), out of which the material for raising the mound was procured, is seen to stretch along its base, and to form several sinuous arms. Like the mound itself, an air of wildness is thrown around this lake, which is increased by the quantity of sedgy plants on its margins, and the common-looking dwarf willows which abound near its western end. In this lake, and in some of the small strips of water by which it is prolonged towards the east, an unusually complete collection of hardy water plants will be found, and these are planted without any appearance of art, so as to harmonize with the entire scene. Being all labelled, as is almost everything else in the garden, there will be no difficulty in ascertaining their names. There is a rustic bridge over one arm of the lake, which, being simple, and without pretension, is quite in character with the neighbouring objects.

Between the lake and the boundary fence, in a little nook formed on purpose for them, the various hardy ferns and Equiseta are cultivated. The plants of the former are put among masses of fused brick, placed more with reference to their use in affording a position for growing ferns, than for their picturesque effect. This corner is, in fact, altogether an episode to the general scene, and does not form a part of it.

On a border near these ferns, and extending along the south side of the lake, are several interesting collections, illustrative of one of the Society's objects, which is to show, in a special compartment, the hardy plants remarkable for their uses in various branches of manufacture. Commencing at the western end of this border, we find first the plants which afford tanning materials. The *Rhus cotinus* and *coriaria*, the Scotch Fir, the Larch, and the Oak, are among these. It is unfortunate that the whole of the plants in this border have not more room; because, being of such very different habits, they will soon outgrow their position, and will then require to be thinned out or removed. Next in order are the plants whose fibre is used for chip plat, comprising *Salix alba*, the Lombardy Poplar, &c. Then follow the plants whose fibre is adapted for weaving cordage, &c. The *Spartium junceum*, Flax, and Hemp, rank in this class. The plants used in making baskets or matting, &c., next occur, and embrace the Lime and Osier among others. Grasses of different kinds then illustrate the plants whose straw is used for platting. The Cork tree and *Populus nigra* furnish examples of plants whose bark yields cork. A collection of plants whose parts furnish materials for dyeing finishes the series, and includes some species of *Rhus*, *Hippophäe*, *Salix*, &c. Altogether, this is a very instructive border, and all the objects are labelled under the respective heads here given, so that they may be readily referred to. If they had proper room to grow in, the compartment would be one of increasing interest.

A large herbaceous garden (6) adjoins the lake at its eastern end, and the plants are here arranged in beds, according to the natural system, the species of each order being assigned to one bed. Of course the beds will thus vary greatly in size. They are edged with box, and have gravel walks between. Three or four crescent-shaped hedges are placed here and there across this garden, partly for shelter, but principally to act as divisions to the larger groups of natural orders. These hedges separate the garden into the great natural divisions, and each of the compartments they form is again subdivided into orders by walks 4 ft. in width, the sub-orders being indicated by division walks of 2 ft. in width. The inquiries of the student are thus greatly aided, and he is enabled to carry away a much clearer impression of the natural system than can be had from books. This is an excellent place for ascertaining what are the best and most showy herbaceous border flowers.

Further on, in the same direction, is a garden (5) assigned entirely to British plants, disposed in conformity with the Linnæan system in long beds, with alleys between. In this division will be seen how very ornamental are some of the plants to which our soil gives birth ; and the less informed will be surprised to find that many of their garden favourites are the natural products of some part or other of our own country.

A well-stocked Medical Garden (4) terminates this chain of scientific collections, and is more pleasing than the other two, on account of the plants being much more varied. The arrangement of this tribe is founded on the natural system, and the plants are in narrow beds, which take a spiral form. If the visitor will commence with the Ranunculaceæ, and carefully observe the way in which the names on the labels read, so as to keep these names constantly before him, he will easily be able to follow through the whole collection in the order adopted. All the hardy plants used in medicine are thus brought together, without reference to their habits, a great deal of useful knowledge being thereby conveyed in a compact form.

This last feature of the garden may possibly be deemed a superfluous one in a metropolis which possesses what is termed by way of distinction a Physic Garden. And we are not by any means certain that a botanical collection of plants with various habits, arranged solely with relation to their natural alliances, can ever be satisfactorily kept up. It is clear, indeed, that in a few years many of the plants in this medical department must be abandoned, or renewed with smaller specimens ; for such as grow to the size of trees would soon fill all the space, while there will not be room for any of them, except the very smallest, to grow to their full and natural dimensions. This evil is, it seems, proposed to be remedied by replacing the plants with younger ones as soon as they get too large.

Near the Medical Garden are the plant-houses, pits, and reserve ground (2), in which all the plants are grown for stocking the conservatory, flower-beds, borders, &c. Here we were happy to notice, during a visit last autumn, that three useful new span-roofed houses had been erected, in a kind of series, which is to be yet further extended. A detached greenhouse contained a considerable number of Pelargoniums, pruned and trained into tall upright plants, which are very useful among masses of smaller things in the conservatory during summer. The plan is worthy of imitation in any place where the plants have to stand on the ground, as, by being rendered thus tall, their flowers are brought more on a level with the eye. There were likewise some standard Azaleas here, of the Indian varieties, which are serviceable in a similar way to the Pelargoniums.

The new houses are constructed in a very simple manner, with a path down the centre, flat shelves or stages at the sides, the hot-water pipes under the stages, near the walls, the lights resting on the side walls, and *all fixed*, with ventilators in the shape of small sashes here and there along near the top of the larger lights, on both sides of the centre. One of these houses, which is used for orchids, has no means of ventilation at all, except at the end, over the door, where there is a small sash capable of being opened. And with proper shading, it is found both here and elsewhere that orchids very seldom require fresh air. The collection of orchids here, as of stove and greenhouse plants in general, is not at present extensive, but is continually increasing. The beautiful *Phalœnopsis amabilis* was producing seed-vessels, which appeared likely to contain sound seeds.

One of the span-roofed houses is almost wholly occupied with a cistern containing the great *Victoria regia*, *Nymphœa cœrulea*, and other aquatics. Although kept at a high temperature, and planted in a tank of great dimensions (27 ft. by 17 ft.), through which hot-water pipes pass, and where the water is maintained in motion by the action of a small revolving wheel, the *Victoria* did not seem, last October, in a happy or healthy state. Since that period, however, the water having been changed, it is, we learn, progressing as satisfactorily as could be wished, and is now one of the finest plants in the country. At the farther end of the aquarium, is a cluster of handsome plants, including a very large and striking specimen of *Asplenium nidus*, a new species of *Ficus*, with singularly fine leaves, and, trained to the roof, a very luxuriant plant of the snake gourd (*Trichosanthes colubrina*). This last curious object bears long thin fruit, sometimes from 3 to 4 ft. in length, like a very slender cucumber, but strangely twisted, especially towards the end, and having white streaks on a green ground. When ripe, it changes colour to a bright red, which renders it exceedingly showy.

From the reserve ground, a few steps will lead to the large conservatory, which is more appropriately termed the Winter Garden. At the eastern end of this conservatory, and in a corresponding place at the other end, there is a very large vase placed on the gravel, no doubt for containing plants in summer, but without either plinth or pedestal. Along the front of the conservatory, at the edge of the terrace, are several more vases, of a handsomer kind.

This large conservatory is doubtless the most remarkable thing in the garden, and is, perhaps, of its kind, the best in Europe. It is rather more than a third part of an extensive design, which is intended to be carried out as soon as the means of doing so can be realized. The original intention was, we believe, to connect this great glass house with the outside road, by a long glass corridor, so that visitors during winter might step from their carriages into the building at once, and proceed, between rows of plants, to the main portion of it, without having to walk through the open garden. This part of the plan has, however, been abandoned. It is of the very lightest description—built wholly of iron and glass. The front is simply adorned with a kind of pilaster, composed of ground glass, neatly figured, which gives a little relief, without obstructing the light. And the central flattish dome has an ornamented kind of crown, which helps to break the outline. Otherwise, on the exterior, there are no pillars—not even to the doors—and nothing but the very lightest cornice, and no decorations of any kind on the ridges of the roof. The roof is for the most part composed of a series of large ridges, the sides of these being of an inverted sort of keel shape, and a transverse ridge extending along the principal front from either side of the projected domical portion. There are smaller lean-to additions at each end, but these are only temporary, and the back is finished with an upright face till the building can be enlarged to its proper width. At present, the extreme length is 176 ft., and the width at the widest part 100 ft. Ultimately the greatest length will be 375 ft., and the utmost width 200 ft. The house is ventilated at the top by small sliding lights, worked by little winches attached to the pillars. These pillars themselves are so exceedingly slender as scarcely to be noticed when the house is well stocked with plants. It is fairly open to debate whether, in the effort to secure the greatest amount of lightness, too much character has not been sacrificed; and whether, in such a large building, the introduction of more massive exterior pillars or pilasters, a bolder cornice, some broad and decided frame-work for the doorways, and a slightly-enriched roof, would not have signally improved the elevation without in the least degree unduly interfering with the supply of light.

The conservatory is marked No. 1 on the ground plan which we have given. We have been favoured with the following account of it.

This building stands on the north side of the Society's grounds. Its construction is simple in character, and without architectural pretence, the principle on which it was designed being, with limited funds, to obtain the largest possible extent of garden covered and enclosed with glass, and temperately warmed, as a promenade for the Fellows of the Society and their friends, in winter as well as summer.

Its length, as already stated, is 176 ft., and breadth 75 ft., exclusive of a centre circular projection, where the internal width is 100 ft. The upright sides are 14 ft. high, and the roof at the centre 32 ft. high.

The roof is supported in the front by a cast-iron moulded gutter, and by iron columns in the interior of the building, placed at 12 ft. distance from each other, in bays or divisions of 25 ft. span. These columns afford support to a variety of climbing plants.

The warming is effected by means of hot water circulating in cast-iron pipes, 2500 ft. in length, placed in brick chambers under the surface of the floor; and by a continuous iron tank 18 in. wide and 6 in. deep, placed in a brick chamber around the building, having a heating surface equal to 2000 ft. of 4 in. pipe. The top of the tank has openings, with circular covers, to emit vapour when required. The heated air escapes by perforated castings level with the floor. Air ducts communicate with the chambers containing the pipes and tank, bringing air to be heated from parts of the house most remote from the heating surface.

Two boilers for heating the water are placed in a boiler-house about 30 ft. to the north-west of the building, one for heating the water in the pipes, the other that in the tanks. An auxiliary boiler is also provided, for giving increased temperature to the water circulating in the pipes, when required. An outer chamber of brickwork is constructed around the furnace-room, from whence also heated air is transmitted to the interior of the house. Additional boiler power is now being added, to compensate for the extra heat required for the stove.

Ventilation is provided by means of sashes made to slide on the roof, and worked simultaneously by means of simple machinery; and at the ends of the house, and in the front by casements hung on pivots. The roof water is conveyed by the iron columns and under-ground pipes into three large tanks. The total cost was about £7000.

The Architect was Mr. Decimus Burton, and the Contractor Mr. Richard Turner, of Dublin.

As in the Horticultural Society's Gardens, three great exhibitions are held here, for flowers and fruit, in the months of May, June, and July. The same kind, and about an equal quantity, of objects are brought to each of these gardens. But the visitor to London, who happens to include a show at both the gardens during the period of his stay, should by all means go to both. The grounds of the two are so very different that it is quite worth while to see the effect of a large number of elegantly-dressed persons promenading in them, apart from the interest of the exhibitions themselves. The annual subscription to the Society for membership is two guineas, and the entrance fee five guineas.

Chelsea Botanic Garden.—The primary object of this garden was to cultivate all the medical plants which were known in this country, so as to form a constant source of reference to medical students. Another, but more secondary purpose, was the gathering together a collection of rare exotic plants; and many of the most ornamental inhabitants of our gardens were first distributed from this establishment.

It is decidedly one of the oldest of existing gardens. Some of the earliest greenhouses known in Britain were erected and heated here. The ancient cedars of Lebanon, supposed to be the first known in this country, are said to have been planted in 1683, being then about 3 ft. high and 5 years old. In the year 1720 Sir Hans Sloane, Bart., a celebrated physician and naturalist, having purchased an estate at Chelsea, gave the site of this garden to the Apothecaries Company, on condition of their making an annual present of plants to the Royal Society. Philip Miller, the well-known author of the "Gardeners' Dictionary," and one of the earliest writers on gardening subjects, was, we believe, the first curator of this garden, and had the management of it for fifty years, having resigned in 1770, at the age of eighty.

At the time the garden was formed it must have stood entirely in the country, and had every chance of the plants in it maintaining a healthy state. Now, however, it is completely in the town, and but for its being on the side of the river, and lying open on that quarter, it would be altogether surrounded with common streets and houses. As it is, the appearance of the walks, grass, plants, and houses, is very much that of most London gardens—dingy, smoky, and, as regards the plants, impoverished and starved. It is, however, interesting for its age, for the few old specimens it contains, for the medical plants, and, especially, because the houses are being gradually renovated, and collections of ornamental plants, as well as those which are useful in medicine, formed and cultivated on the best principles, under the curatorship of Mr. Thomas Moore, one of the editors of the "Gardeners' Magazine of Botany."

This garden is situated by the side of the Thames, near Chelsea Hospital, and is entered by a gate in a side lane. It covers only a small area, and is not laid out for much ornamental effect. On entering by the gate we have mentioned, the principal plant houses are nearly straight before the visitor, being only a trifling distance to the right. The herbaceous garden and more decorated part lies to the left, and the medical department, with the lecture room and offices at the back of it, are on the extreme right. The first thing to be noticed is an ancient cork tree, which is a good deal enfeebled by the bad atmosphere, but is large and tolerably sound. This must have been one of the first specimens introduced into Britain. In the middle of the garden is a fine marble statue of Sir Hans Sloane, by Rysbach, with all the smoothness taken from its surface by the action of the weather, and thus made to resemble stone. It is an example of what may be expected from marble when a great many years exposed in our climate.

Between the statue and the river, on either side of a walk which leads to the margin of the water, are two venerable cedars They are not remarkably large nor particularly handsome, some of the branches having been shattered by a storm in 1809. The circumference of the trunk of one of them is 15 ft., and that of the other 12 ft. Their conspicuously flat heads give them, however, a most striking character; and standing so near the river, in a low district, they are seen for some distance, and always tell powerfully on the landscape. Every passenger by the steam-boats must have noticed and admired them.

Temple Gardens, London.—Those who have only seen these gardens at a dull season of the year will at once assume that, except for their historical associations, and as presenting a rather dusky green plot of open ground in the desert of London houses and streets, we can have nothing worth communicating with respect to them;—nothing, at least, that would render a visit remunerative. Such, however, is not the case. We have ourselves been both astonished and delighted by an inspection of them in the later autumn months; and from the information of two of our kind friends, as well as from our own cursory glance at them, we now furnish a brief account of what is here to be seen.

These gardens are divided into two parts, one belonging to the Inner Temple and the other to the Middle Temple. The former of these is a considerable area, of about three acres. Except a slight extension to the west, along the water side, it is of a nearly square figure. A border for flowers extends round three of its sides, that towards the river being kept open. The rest is neatly-mown grass, with broad gravel walks in good condition, the one by the side of the river being largest, and affording a good river view at high water. A few small trees are scattered about, three elms on the grass appearing to be very healthy and thriving. There is an ancient sycamore on the lawn, now unfortunately dead, which once stood close by the side of the river, that here formed a bay. The trunk and branches of this tree are now very judiciously being covered with ivy, and with the aid of props will last a long time. Nothing could be plainer than the whole of this garden, which wants a few masses of shrubs and some good fountains. In the borders, however, many old summer flowers, such as sweet-williams, wallflowers, irises, mignonette (which is a first-rate town plant), and other well-known but frequently discarded herbaceous plants, with numerous crocuses and snowdrops in spring, are successfully cultivated by Mr. Brome, the gardener. But the chief feature of the garden is the chrysanthemums, which under his management here attain a surprising degree of perfection.

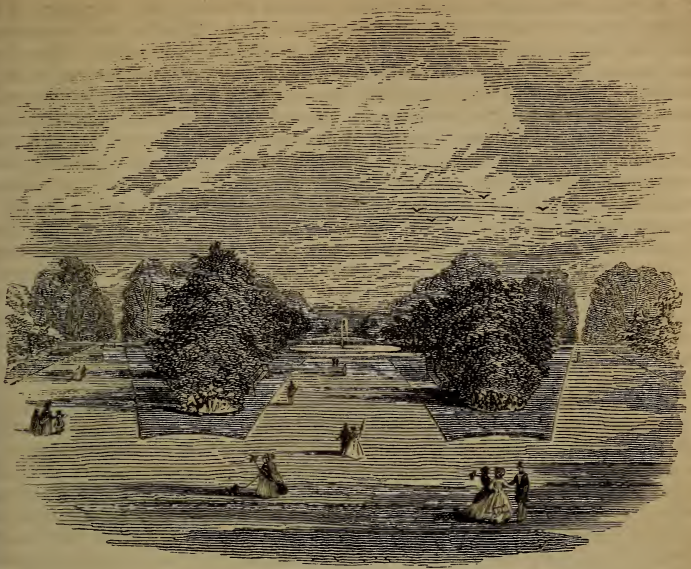
Of much more contracted dimensions, the garden of the Middle Temple is arranged with superior taste, having more trees and shrubs, and a number of beds happily placed about the lawn, so as in some measure to disguise its shape and limits. Here, too, besides the flowers before mentioned, and stocks, and annuals, chrysanthemums are the leading element.

Nearly adjoining this is a smaller plot, half enshrouded with trees, in the middle of which is one of the few fountains of which London can boast. Although of the plainest description, with a simple half-inch jet, which throws the water 10 ft. in height, it is difficult to convey an adequate notion of the cheering effect which its sound, and sparkle, and coolness, communicate to the passers-by in the heart of the metropolis on a hot and dusty summer's day. Were the jet of a different character, and made to scatter the water more, the pleasure it occasions would be still increased. When looking at it, even as it is, however, one cannot help regretting that such objects are not of frequent occurrence in a town of such magnitude and with such resources.

At the back of the Temple Church, in a small piece of ground fronting the master's house, is a remarkable Jargonelle pear-tree, fully 35 ft. high, well branched, and with a proportionately stout trunk. In this dingy corner, where everything is darkened with soot, it is pleasant to see such a vigorous specimen, and to learn that it last year bore nearly a bushel of tolerably good pears.

Hampton Court.—The great merit of this very striking place is that it has a *character of its own*, and that this character is alike adapted to the situation and country in which it happens to be placed, and to the palace of which it is the accompaniment. Perhaps there is not another garden round London of which this can be so truly said, or one of which the visitor will carry away such a clear and lasting impression. And though it has lately been the fashion to decry the style of gardening of which Hampton Court presents one of the very few remaining specimens, we doubt whether, in its leading features, anything more suited to the dignity of such a palace, or more in harmony with the flatness and tameness of the surrounding country, can be found. In this praise, however, we do not include what is called "the wilderness," which is only a subordinate and inferior part of the whole, and which might be removed without any loss, beyond the shadiness of walks which it affords.

It is most unfortunate, as far as the effect of the garden is concerned, that the public are only admitted through the wilderness. If access could be obtained by what are termed the "flower-pot gates," the noble terrace walk, which passes the east front of the palace, and which is probably one of the finest in England, would then be entered at once. Starting from these gates, after just glancing at the beauty of the flower baskets and groups of fruit by which their piers are surmounted, let the visitor imagine the wall on the right to be architecturally treated, in a manner worthy of the palace, and carried through in the same style to the margin of the river, the walk being terminated by appropriate iron gates and piers, or by a handsome small temple or summer house, and a more majestic picture can hardly be conceived. Passing along this walk towards the palace, the wall on the right will be seen to be covered with a variety of climbers, and, just by the side of the Tennis Court, which is the first part of the building that is reached, there is a very fine specimen of *Catalpa syringæfolia.*



HAMPTON COURT GARDENS.

When the centre of the palace is gained, the outline of the garden and the avenues in the park will then be distinctly perceived. The principal part of the garden is comprised within a semicircular figure, from the sides of which, running north and south, a broad and lengthened oblong strip is extended. Besides the principal walk along the palace front, there are three leading walks radiating from the entrance to that front, flanked with lines of yew trees, and prolonged to the very entrance margin of the park by avenues of lofty limes. At the end of one of these avenues, the tower of Kingston Church gives an excellent finish to the vista. But this happy circumstance reminds one too strongly of the defectiveness of the terminations of the other avenues, which would acquire much greater dignity by having a tower, pillar, or some object of the kind to stop them. A very artistic group of trees, carried up to a point by a large Lombardy poplar, would even be a sufficient finish to the central avenue.

About the middle of the central walk in the garden, is a large architectural basin of water, with a fountain, and a number of remarkably fine gold fishes. From the boundary of the garden, along the middle of the central park avenue (which, it should be observed, is much broader than the side ones), is a piece of water about three-quarters of a mile in length, and with straight sides, which is quite in harmony with the rest of the place; and a narrower canal, with a walk by its side, behind a noble grove of lime trees, is continued from this, near the margin of the garden, throughout its entire length. It is filled with aquatic plants and fishes; but, from the proximity of the lime trees, is seldom perfectly clean.

At the south-west corner of the garden, fronting the orangery, is a large lean-to house containing the famous vine. The inside dimensions of this house are about 72 ft. in length, and 30 ft. in breadth. The vine is planted inside the house, and the whole of the floor is paved with flagstones. The roof is almost entirely covered with branches, which are not trained in any particular method. One of the branches is described as 110 ft. long. The tree bears a pretty equal annual crop, neither the bunches nor berries being large, but the latter generally ripening and colouring well without any fire heat. About 1200 pounds was stated to us as the average yearly produce of the vine; and the grapes are sent to supply her Majesty's table. In the autumn of 1850, when we last saw it, the crop was healthy, and quite free from mildew. It has been conjectured that the roots of this vine have found their way into an old sewer near the house, and that this helps it to retain its vigour. The tree is believed to have been planted in 1768, by Lancelot Brown, who was once gardener at Hampton Court, and who afterwards became so much noted as one of the first practitioners of the English style of landscape gardening.

Near the labyrinth is an entrance known as the "Lion gates," which are particularly handsome; and on the opposite side of the road is Bushy Park, with its magnificent avenue of horse chestnuts. These splendid trees are remarkable both for their size and for the great variety in their character, as regards the period of their coming into foliage and shedding their leaves, the shape and surface of the fruit-shell, and the appearance of the leaves. From the time when they first begin to unfold their leaf-buds till the autumn has quite stripped them, they are always interesting, but particularly so in June, while they are in full flower, and towards the end of September, when the leaves are changing their tints. The avenue is broken not far from the Hampton Court entrance, by a large circular basin, with a figure on a pedestal in the centre. The trees are made to follow the outline of this basin, and although an interruption to the line is thus occasioned, they acquire more variety of character at this point. The avenue is backed up on each side by several rows of lime trees, and there are many picturesque thorns scattered about the park on the east side.

Hampton Court Gardens were originally commenced by Cardinal Wolsey, who formed the wilderness and the labyrinth. In the reign of Charles II. the large semicircle on the east side of the palace was planted. But it was reserved for William III., who resided a good deal at the palace, to bring the garden to its highest state. At this period, the art of clipping yew and other trees into regular figures reached its highest point, being greatly favoured by the King. Four urns, said to be the first that were used in gardens, were also planted by William III. in front of the palace. Walpole says that the walls were once covered with rosemary, and that the trees were remarkable specimens of the topiary art. (See also pp. 883 and 884.)

Beulah Spa.—Situated at the southern end of the range of low hills on which Norwood stands, and being not more than seven or eight miles from London, this place was formed sixteen or eighteen years since, and became one of very fashionable resort. It is made, for the most part, out of a young oak plantation or coppice, on the south slope of the hill, and, with the exception of a small open lawn about the centre, and a diminutive piece of water near one side, consists of an almost infinite series of walks cut through the wood, these walks being hidden from each other by low bushes, brambles, and wild brushwood, the whole forming a very agreeable summer retreat, on account of its wildness, and rusticity, and indefiniteness, and shade. On the upper side, however, there is a more open terrace walk, from which, as well as from a point where a camera obscura once stood, extensive views are obtained. Around the lawn already mentioned, and in other parts, some good rustic buildings, some of which have possessed considerable merit, exist; but these and the entire place are all now more or less decayed and neglected; and the remains of Perge Wood, which lie between it and the Annerly Station of the Croydon Railway, and which formerly had a fine forest-like character, will afford more pleasing wood walks, while better views of the country, on all sides, may be had from various other points in this most agreeable and picturesque neighbourhood.

In dismissing the *public gardens* of the metropolis, on which we have dwelt longer, because they are more decidedly national, and because, also, we can point to them with a good deal of general satisfaction, we must remark, by way of excuse for having offered what may seem to be so many objections and hints for improvement, that we have considered these gardens, from being the property of the nation, or from belonging to public bodies, as legitimately open to criticism. In these cases, therefore, we have departed a little from the plan laid down, partly because a free discussion of such matters, when it does not trespass on private feelings and rights, is always beneficial, but chiefly to carry the visitor away from the contemplation of the defects by showing him how, with a few trifling alterations, particular points may be restored to their proper influence. In accomplishing the remainder of our task our hope is to be able to adhere to our first rule.

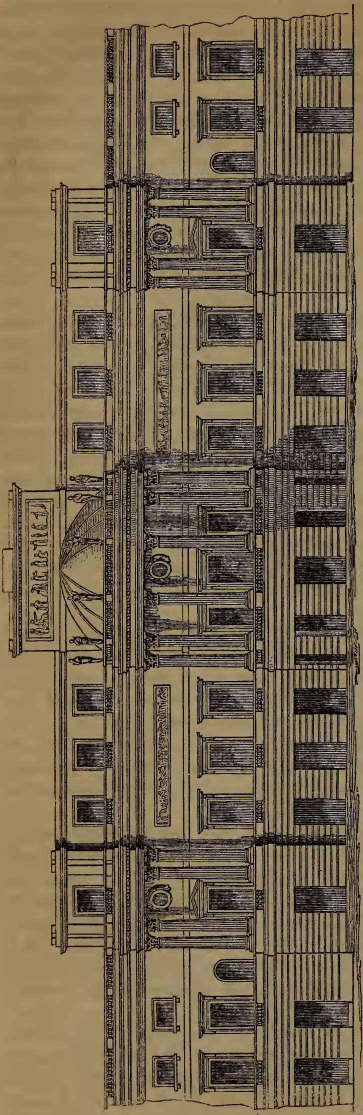
PRIVATE GARDENS.—The environs of London are, as might be expected, rich in almost every variety of these; though they are more generally such as belong to the villa class than those which are proper to the country mansion. Among them, however, will occur some fine examples of different kinds of gardening. But as these gardens are not so readily accessible, and do not comprise such a variety of objects, as the public ones before described, we shall sketch their principal features more lightly, endeavouring merely to show the more distinctive characteristics of each.

Buckingham Palace Gardens are attached to the London residence of her Majesty the Queen; and those who have not actually been through them will be surprised to learn that they comprise about 40 acres, of which nearly 5 acres are devoted to a lake. Considering how thoroughly they are imbedded, as it were, in the town, this is an area, for exclusively private use, quite worthy of even a Royal Palace; especially as it is bordered on the north side by the open space of the Green Park, while the east front of the palace overlooks the whole of St. James's Park, with its large sheet of water.

On the south and west sides, these gardens are inclosed by streets and their accompanying houses. The buildings on the southern side being most inconveniently near the palace and gardens, and being mostly of an inferior character, have been happily shut out by a large bank of earth, raised in George IV.'s reign, and planted both with trees and shrubs. The existence of a number of fine old elms, too, in the western part of the gardens, includes all but here and there a portion of the lofty houses in Grosvenor Place, so that in fact the gardens are rendered almost entirely private during summer; while, by the arrangement of the planting in many parts, the most perfectly secluded spots are secured, where no effort is required to imagine oneself in the midst of a purely country district.

Windsor Castle Gardens.—With the exception of the flower-garden on the eastern terrace of the Castle, these gardens are more commonly known as "the Slopes." They extend from the town of Windsor, at the north-western corner of the Castle Hill, to the public walk which crosses the Home Park from Datchet to Frogmore. Occupying, as their name implies, the face of a long hill which is picturesquely varied in parts, and commanding the most splendid occasional prospects into an extensive country, and always having the magnificent accompaniment of the Castle, of which the most delightful peeps or open views are sometimes obtained, a walk through these gardens will do little more than satisfy the curiosity of the visitor. In all matters of taste, they certainly cannot be taken as models. And it is greatly to be deplored that so glorious a palace, on a site so peculiarly favourable for picturesque treatment, and overlooking such a number of interesting and classic scenes, should have no ground attached to it which really deserves the name of a pleasure garden.

Before entering upon the Slopes, however, we shall carry the visitor to the Castle terraces. That on the northern side is always accessible to the public, and, in walking along it, just within the wall, some highly beautiful scenes will be unfolded, to which the trees on the slope of the hill


BUCKINGHAM PALACE GARDEN FRONT.

often form appropriate foregrounds. To the west, especially of an evening, the windings of the river Thames, somewhat disfigured of late by the long wooden bridge and viaduct of the branch from the Great Western Railway, stretch away in great beauty and variety into the distance, and are often exquisitely illuminated. On the north, a little below the terrace, Eton College, of which there is an excellent view, frequently becomes visible through the trees. In the north-east, Harrow-on-the-Hill, with its gleaming church spire, is a very conspicuous object. And the bank itself, beneath the Castle, has, in parts, a beautiful clothing of shrubs and trees, as viewed from the terrace, particularly towards the western end.

The eastern terrace is only open to the public on Saturdays and Sundays, after two o'clock. This terrace, which is a continuation of the northern one, and on the same level, surrounds a sunken area of between three and four acres, which, being on that side of the Castle where the private apartments are situated, is formed into a geometrical flower-garden. Nothing could be finer than the views from this terrace into the open country, across the Little Park. A few old elm trees in the Little Park serve to break up the scene into several portions, the outlines and character of which change as the visitor shifts his position; and after the eye has ranged over an immense tract of country, richly clothed with trees, and diversified with smaller swells and undulations, the view is terminated by some of the Surrey hills that lie nearest to London, and by here and there a glimpse of one or two of the Kentish eminences. To the south-west and south, the nearer high ground of the Great Park, with its noble woods, forms the line of the horizon; and much of the country seen from the north terrace is observable also, in a different aspect, from the eastern one. Bastions are thrown out at the angles of the terrace, which contribute to heighten its effect: and the visitor can pass from it along the south front of the Castle, from which the best idea of the long walk and the statue which terminates it will be obtained.

Steps from the raised terrace conduct, at several points, down into the flower-garden, which is further connected with the terrace all round by a sloping bank of grass. The general shape of this flower-garden is oblong, with a semicircular end. But it is not entirely regular, the northern side being the widest, and having some extra flower-beds in front of the orangery. The terrace itself forms an irregular pentagon.

A broad walk leads from some steps in the centre of the Castle down the middle of the flower-garden to another flight of steps which carries it on to the terrace. In the centre of the garden there is a circular basin, containing a fountain composed of numerous small jets; and round this basin the middle walk passes, diverging right and left into other walks, at right angles from it. These side walks join another walk that passes entirely round the garden. Between the cross walk and the Castle are two oblong areas, around the edges of which flower-beds are ranged, on the grass, the centre being kept as open lawn. These beds are slightly raised, with sloping grass edges, and are filled with roses, and a variety of the usual summer flowers. In the space between the cross walk and the terrace other beds occur, and are furnished chiefly with shrubs. There are also a few beds between the surrounding garden walk and the terrace banks, and these, too, are supplied with shrubs. In both these latter cases, the shrubs are commonly arranged in masses of one sort, occupying either the whole or a portion of a bed. We observed groups of *Phillyrea, Arbutus, Laurustinus,* and many others ; but nothing either very rare or very effective, and nothing at all, in the way of shrubs, having any reference to the style of the garden or the character of the Castle.

Beneath the terrace on the northern side of the flower-garden is a conservatory or orangery, furnished with the hardier sorts of old greenhouse plants, and having a grass slope from it up to the level of the flower-garden, with a number of flower-beds on this slope. This orangery appears most unhappily placed, being so much below the level of the flower-garden, and having the ground sloping directly down to its front.

Scattered throughout the flower-garden, but arranged symmetrically, are some exceedingly handsome urns, of considerable size, and the highest character and keeping. But, placed among these, there are likewise many bronze and other figures, brought from other Royal gardens, and only fit to be the accompaniments of an Italian palace. A noble bronze cast of the celebrated Warwick vase is placed near the Castle, opposite the centre. The wall of the terrace immediately beneath this east front of the Castle is covered with good climbing plants of various kinds.

In the choice of flowers to fill the beds in the flower-garden, and the levels of the verges to the walks, and the line of edgings to the walks, and the general keeping of the garden, nothing like a high tone of gardening, or first-rate order, was at all observable when we saw the garden last autumn. Everything seemed to be arranged and kept in a decidedly inferior manner.

A door through the back wall of the orangery leads us at once to the Slopes ; and here we immediately begin to see the country on this side in fresh aspects. The trees, through the openings among which we look, acquire additional height and importance now that we are on a lower level, and it is more easy, by choosing a position, to use them as changing frameworks to the various pictures, or for excluding things that are not wished to be seen.

Taking the walk towards the west, in order to get to the bottom of the Slopes, we see, in descending, more of the boldness of the hill on which the Castle stands, and learn how beautiful this bank might easily be made by the free introduction of an appropriate undergrowth of different sorts of bushes, grouped a good deal into irregular masses, thrown carelessly about as if they have been dropped there by nature, and tangled over occasionally with the wild honeysuckle, briar rose, clematis, and ivy. No place could be better adapted than this bank for such semi-natural treatment.

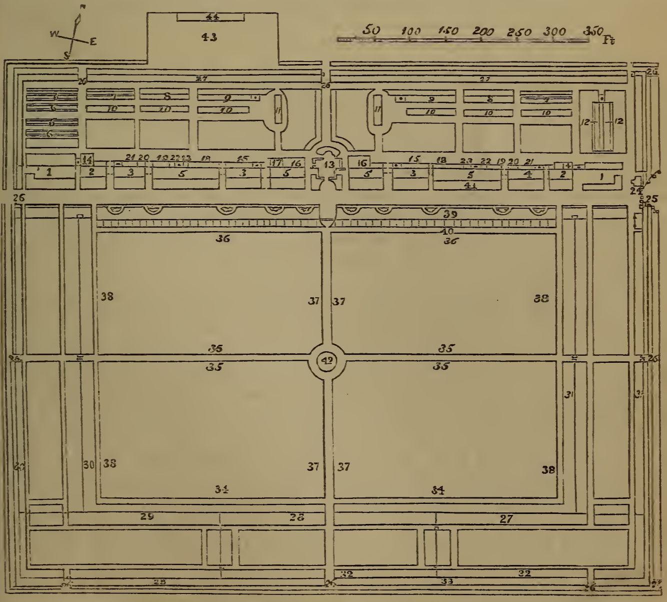
The garden around what is known as Adelaide Lodge, a small summer cottage, is prettily situated, and was completed under the superintendence of the late Queen Dowager. The ground about this lodge has some very pleasing undulations, and falls away very gracefully, many firs and other large evergreens, with mixed masses of several kinds of shrubs, being judiciously placed on the lawn and round the margins of the garden, so as to give the whole an agreeable and picturesque air. Numerous flower-beds, used for verbenas, pelargoniums, and similar summer ornaments, are placed on the lawn in the neighbourhood of the lodge ; and not many yards from it a gate will admit us into the path across the Home Park, proceeding by which, to the right, we may visit her Majesty's kitchen gardens.

The *royal kitchen gardens* at *Frogmore* exhibit as fine a specimen of kitchen and fruit gardening, in all the departments of the latter, as is to be found in Europe. We doubt, indeed, whether there is any other garden of the kind which will, in its principal features, bear the least comparison with it. And this is precisely as it should be; for, in a country where gardening is carried to so high a point, we naturally expect to see some of the most perfect examples in the royal gardens.

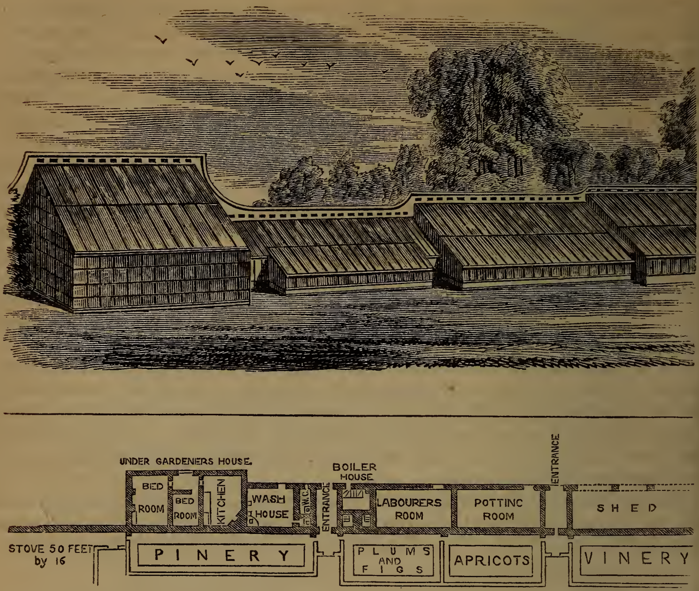
These kitchen gardens are of comparatively recent formation, having been begun at the end of 1841. They are the result of the abandonment of the old royal kitchen gardens at Kensington, Hampton Court, Cumberland Lodge, Maestricht, and Kew, and the determination to concentrate the whole into one first-rate establishment. It having been found so very unsatisfactory to have the royal gardens scattered about as they were before, this method of combining them, and thus increasing their efficiency, was adopted at the recommendation of a commission of inquiry, of which Dr. Lindley was the head.

In order to enable the reader better to understand the general arrangement of these gardens, we present a ground plan of them, on a small scale, as they existed in 1849, which we are obligingly permitted to use from cuts which have appeared in the *Gardener's Chronicle.* A slip of 8 acres has been added to the lower part of them, making the entire area of the gardens about 32 acres.

Being only about a mile from Windsor Castle, the pleasure grounds at which are destitute of any kind of plant structure except the orangery, one of the aims in forming these gardens has been to combine



GROUND PLAN OF GARDEN AT FROGMORE.

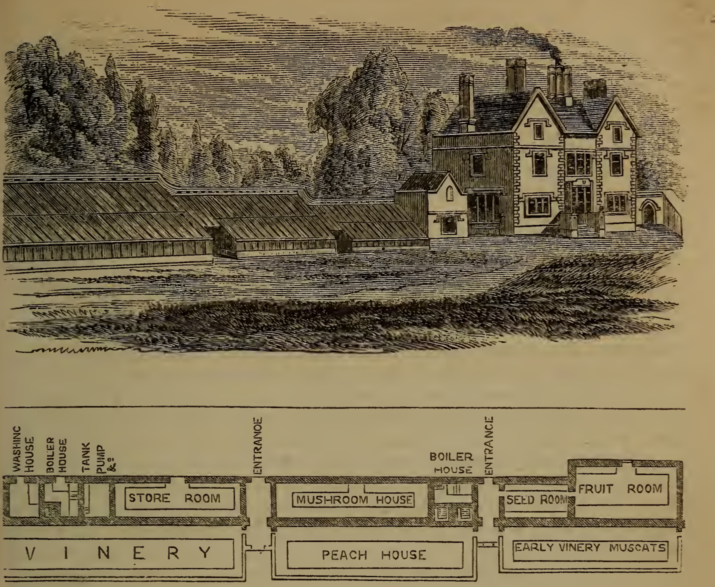

UNDER GARDENERS HOUSE.
BED ROOM
BED ROOM
KITCHEN
WASH HOUSE
W.C.
ENTRANCE
BOILER HOUSE
LABOURERS ROOM
POTTING ROOM
ENTRANCE
SHED
STOVE 50 FEET by 16
PINERY
PLUMS AND FIGS
APRICOTS
VINERY

FORCING HOUSES

ornament with use, and render them sufficiently neat and attractive to be worth visiting by her Majesty and the guests at the Castle. Hence, in the great range of houses, a compartment at each end has been reserved for greenhouse and stove plants; a broad terrace walk, with flower-beds and borders, and vases on a low terrace wall, extends along the front of the range; a handsome fountain, with a large basin composed of Aberdeen granite, occupies the centre of the garden; the walls are adorned with sculptured ornaments at the end of the terrace; and rooms are fitted up, in the front part of the gardener's residence, for the use of her Majesty.

An air of extraordinary cleanliness and order pervades every part of these gardens. The walks are all gravelled, with neat box-edgings, and kept scrupulously free from weeds or soil; the sides of the walks are furnished with well-trained and regularly-trimmed fruit trees; the crops are all even, and free from weeds, and arranged with great regularity; the range of houses is, both in its structure and keeping, a perfect model of neatness and elegance; and even the back sheds, and the department filled with pits and the smaller forcing houses, are equally tidy, and seem to invite inspection. The walls of the back sheds are, indeed, covered with pretty climbing plants in summer, and look more like a row of beautiful little cottages than the places in which the materials of a kitchen and forcing garden are stored, and its processes carried on.

We proceed, however, to describe the gardens, with reference to the plan, p. 503. Entering by a bold gateway, adapted for carriages, at 25, the



AT FROGMORE.

porter's lodge (24) is on the right, and the broad terrace walk immediately opposite the entrance. The range of glass, extending to the length of nearly 1000 ft., inclusive of the gardener's house, stretches to the right of this terrace walk, and has an aspect a little east of south. On the left-hand side of the terrace walk is a broad grass verge, with a few semicircular flower-beds and an herbaceous border (39), backed by the terrace wall, which has vases on it in the centre and at either end, and 40 is a series of oblong flower-beds. The vine border (41) is also kept filled with flowers, and, when we saw it last autumn, looked very gay with alternate rows of the Tom Thumb and a pale pink Pelargonium, which were particularly luxuriant. Gates and piers finish the terrace walk at 26, which number indicates a gate or door wherever it occurs.

Just within the entrance gates, between the lodge and the range of glass, there is a very handsome plant of *Clematis montana* on the wall. It is treated somewhat like a vine, being trained to several upright stems, and spurred back every year. The result is that it throws out great tufts of its charming white flowers from each of the joints, and has a curious as well as beautiful appearance.

In examining the range of glass houses, it will be seen that the tameness of their front line is broken by the additional projection of the stove and greenhouse at the ends (No. 1), and also by the greater width of the large vineries (5). The houses on either side of the great vineries are likewise broader than the two smaller vineries which adjoin the gardener's house, and the pine stoves (2). And the heights of all these correspond to their width. The end plant houses are highest and broadest, and the pine stoves next them are lowest and narrowest. Between every two of the houses there is likewise a small glazed porch, 7 ft. square, which makes a further break both in the front line and the elevation. And the handsome gardener's house (13) in the old English style, which occupies the centre of the range, contributes yet more to vary and enliven it*.

There is much in the construction of these fruit houses which is calculated to excite our admiration. They are of the usual lean-to character, with low upright sashes in front. But the roof is entirely of iron, except that the rafters are capped with light strips of wood, to prevent them from becoming too hot, and the sash bars, which are made hollow in order to allow for their expansion and contraction, are of copper. The doors, too, are of iron, with brass hinges to avoid rust. The houses are ventilated by means of the front lights; the whole of the lights in each house being raised simultaneously, to any required extent, by one or more turns of a winch placed at each end, and connected with a horizontal bar passing through them. Every alternate upper light is also made to slide down with the utmost facility on pulleys, by a "quadrant wheel jack," which acts most perfectly, the ropes being formed of patent copper wire. Other ventilators, for winter use, are placed above the houses, in the wall, where a grating is inserted, and communicate with the houses through openings in the upper part of the back walls; these being furnished with flap doors, all which can be opened or shut at once by simply turning a winch attached to the proper machinery. The most complete ventilation can thus be secured in safety at all seasons, and with the smallest possible expenditure of labour. The whole arrangement is of the simplest description, and appears to answer well, very rarely getting out of order. The only improvements that have been made upon it are in some smaller new houses which have subsequently been erected, and in which the front lights are made to open outwards, turning on a centre pivot, and not upwards, while the winch for working the apparatus is kept within the house, and is not thus exposed to the action of the weather, and can be more conveniently worked.

Claremont is the well-known seat of his Majesty the King of Belgium, and was assigned to him by the Crown on his marriage with the Princess Charlotte. It has been occasionally used by the Queen for short periods of retirement from Court life, and is now occupied by the family of the late King of the French. It was here, indeed, that the exiled Louis Philippe found a home, and here he breathed his last only a few months since.

We cannot wonder that our Queen should choose this place as a quiet retreat from the forms and show of a palace residence, as it is eminently adapted to foster the idea of seclusion. Standing on an eminence in the midst of its own ample woods, the prospects from the house and grounds are purely sylvan or rural. There is scarcely a human habitation visible for 30 or 40 miles on the south and west sides, and the neighbouring village of Esher and the high road to Portsmouth are quite concealed on the north and north-east by woods or swells in the ground.

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* Other Numbers on the plan indicate the following:—3. Peach houses; 4. Apricot and Plum house; 6 and 7. Pine pits; 8 and 9. Cucumber houses; 10. Pits for melons, strawberries, &c.; 11. Cherry houses, exhibiting improvements in ventilation; 12. Asparagus beds, heated by hot water; 14. Dwelling and sleeping rooms of the workmen; 15. Mushroom houses; 16. Fruit rooms; 17. Seed rooms; 18. Store rooms; 19. Open sheds for barrows, &c.; 20. Potting sheds; 21. Work rooms for indoor operations; 22. Sheds for washing vegetables; 23. Tool sheds; 27. Apricot wall; 28. Peach and nectarine walls; 29. Cherry wall; 30. Walls for plums; 31. Walls for pears; 32. Walls for currants and gooseberries; 33. Walls for figs, mulberries, &c.; 34. Dwarf plum trees; 35. Dwarf apple trees; 36 and 37. Pear-trees on trellises; 38. Dwarf cherries; 43. Manure and compost yard; 44. Stables, cart-sheds, &c.

Chiswick House (*the Duke of Devonshire's*).—From the reputation for taste which the Duke of Devonshire has acquired, the visitor who is unacquainted with the gardens attached to this elegant villa will no doubt expect to see something beautiful, and we do not think he will be disappointed. This is certainly one of the most satisfactory and delightful places round London, and being only five miles from Hyde Park Corner, and thrown open, with his Grace's usual liberality, to all who attend the July exhibition of the Horticultural Society (which adjoins it), we shall describe it more at length.

The great characteristic of the place, like that of Claremont, is seclusion. Although close upon the great world of London, and in the very midst of a populous district, the quietness and privacy of these gardens are complete. They are, however, placed in such a district as to render any but the most limited views from them impossible and undesirable; and hence the whole of their attractions are within themselves. They cannot boast of varied and beautiful undulations of surface either; but there is an air of finish, and richness, and classic refinement about them which quite compensates for the want of natural picturesqueness.

Much of the state in which these gardens are now seen is due to the present Duke. Before he came to the title, the place was a very cramped and meagre one. A great deal of additional land has been acquired, and appropriated to ornamental purposes. In fact, the estate, under the influence of his Grace's enlightened feeling, has been quite transformed. Approaching it from the high road at Turnham Green, what is called the Duke's New Road, by the side of the Horticultural Gardens, has been formed by the present Duke, and has a row of handsome lime trees on either side of it, which have now attained a considerable size. Access is obtained to the place by this route through a pleasant and private avenue, without going round by the narrow and awkward lanes of Chiswick.

Across the western lawn in a rather more northerly direction, beyond the capital specimens of *Abies Douglasii*, *Pinus Cembra*, and other excellent Pines, a glimpse of the classic temple, with its Doric porch and its small dome, but half hidden amongst large yews and other trees, is obtained. The manner in which this beautiful temple is half seen half concealed, and the harmonious grouping of the trees and shrubs around it, makes a charming picture from the house and from numerous other points throughout the grounds.

At a short distance to the right of the temple, a peep is just procured of the elegant Palladium bridge over the canal, which is distant and bold enough to form a good object in the scene, and enriches without encumbering it.

Further to the right, and situated on the top of the lawn, near the house, some gorgeous old cedars, the lower branches of which spread down in the most graceful manner, and sweep the grass, constitute one of the noblest features of the place. They are not so large as in some other gardens,—either as regards the girth of their stems or their height; but probably they are unequalled in beauty, and stand in a peculiarly appropriate position. A broad gravel walk passes along the garden front of the house, and another broad walk strikes off from this, at a right angle, opposite the centre of the house. The cedars are on either side of this latter walk, their branches spreading out to within 8 or 10 ft. of the gravel, and 50 or 60 yards from the house. There were formerly three of them on each side, but one unluckily died a few years ago. Each of them has a different character; but they are sufficiently alike to blend well together, and those on the top of the western lawn acquire, from their position, and from getting more sun, a most magnificent aspect. Between the cedars and the house, and likewise at the other end, specimens of the Deodar Cedar have been planted, and are now from 15 to 20 ft. high. Stone figures of a bear and a boar stand on large pedestals in a line with the front of the cedars, near the house, and there are large stone urns nearer to the cedars, at each end; thus maintaining the dignity and art-like character of the whole.

A very charming effect is realized on this side of the house by having two of the windows in the basement story formed into mirrors, in one sheet. In these the whole of the lawn and the cedars, &c., are most clearly reflected; and, as the scene is altogether in such a high style of art, there is nothing unworthy or objectionable in this expedient, which is really a very excellent and novel one. One of the large bold upper windows, which is fitly enriched (the house being in the Italian style), and glazed with immense sheets of plate glass, coming opposite the walk of which the cedars compose the side fittings, and a fine porphyry urn being placed on a stand just within the central compartment of this window, the effect of this is also good from the other end of the walk.

The large central walk is terminated by a circular plot of grass, at the back of which, arranged in a half circle, and enshrouded with large evergreen oaks, are some very ancient and mutilated marble figures of Cæsar, Pompey, and Cicero, from Adrian's Villa at Rome, interspersed with ornamented stone seats from the Roman Forum. At either corner there are busts of Homer and Hesiod, and the ends are occupied with large stone figures on pedestals of a lion and lioness, with busts of Virgil and another poet at the other corners. This classic spot is called the Poets' corner. Seated in the midst of it, beneath the shade of the venerable old oaks, and looking out to the lawn, the cedars, and the house, with the tops of the other tall cedars at the entrance side of the house clustering around the dome, it would be difficult to imagine a scene more finished, consistent, and classical.

Within the flower garden, the beds are arranged in regular figures, divided into several compartments on each side, so as to suit the general form of the plot. A few of these compartments have the beds cut out in the grass, with broad grass margins; but the bulk of them are separated by gravel walks, with box edgings. Some of the larger and central beds in the compartments are raised a foot or two above the rest, to relieve the flatness which would otherwise result from having so large a surface covered with flowers. The system of putting one sort of plant, with flowers of a distinct and decided colour, in each of the beds, is the one adopted for filling this garden, and answers most effectively. Indeed, in so large a space, any other plan would be productive only of confusion; for, when the garden was furnished with mixed herbaceous plants, several years ago, it had an exceedingly tame and common appearance. A few small sculptured figures, on pedestals, and some plain vases, filled with scarlet Pelargoniums and other summer plants, form agreeable breaks and raised points in the garden during summer. Pansies are a good deal used for covering the beds during winter and spring; but, as the flower garden is so large, and in quite a detached portion of the pleasure grounds, no systematic attempt is deemed necessary for supplying it with evergreen furniture in the winter. This flower-garden, with its accompanying range of glass houses, shrubberies, &c., is part of the additions made to the place by the spirit and taste of the present Duke.

Corney, another small property, formerly belonging to the Earl of Macartney, and situated by the side of the Thames, a little above Chiswick Church, belongs to the Duke of Devonshire, and is used as a bathing place. On the lawn, near where the house once stood, are magnificent specimens of the Tulip tree, and there are very fine plants of various thorns, of *Pyrus spectabilis*, and of *Liquidambar styraciflua*. The masses of Portugal laurels are also unusually large. On the terrace, too, by the river side, are some handsome plants of the *Pinus pinea*, the seeds of which were collected by his Grace on Mount Ætna.

At the *Grove*, which also belongs to the Duke of Devonshire, and is still higher up the river, near Strand on the Green, there are in the park some extraordinary Spanish chestnut-trees, the magnitude and grandeur of which are probably nowhere surpassed. The girth of three of them, at one foot from the ground is respectively 22 ft. 2 in., 24 ft. 4 in., and 26 ft. 2 in. They are perfectly sound, to all appearance, with a clear straight trunk, and most spreading and well-balanced heads. Many others exist besides those of which the dimensions are thus given, and are almost equally large. When in full foliage, and covered either with flowers or fruit, they are truly glorious objects; for very few things in nature can equal a majestic old tree, whether in picturesque decrepitude and ruin, or, as in this case, in the full richness and luxuriance of its meridian strength.

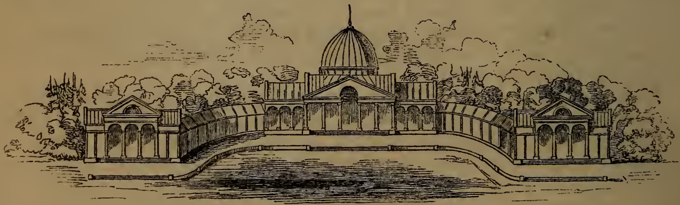
Syon House, the seat of the *Duke of Northumberland*, is about two miles higher up the river than Chiswick, and is between Brentford and Isleworth, nearly opposite Kew Gardens. It is at present occupied by the Dowager Duchess. The gardens have been much celebrated as containing an extensive collection of large hardy exotic trees, and a splendid range of plant-houses, with a bold mass of rockery in front, and a well-arranged kitchen garden, comprising many forcing-houses, which are built chiefly of iron, and, at the time they were erected, combined every known contrivance that could render them perfect.

At the present time the only one of these features that has undergone much alteration is the kitchen-garden department, which, not being so much required, has been allowed to fall somewhat into the shade. Some of the forcing-houses, indeed, are now devoted to plant culture; and two very interesting new houses have been erected in this department—the one for the culture of tropical fruits, and the other for growing the large water lily (Victoria regia).

The kitchen garden covers between three and four acres, with an extensive range of glass houses in it. Its shape is a nearly regular parallelogram, but the ends are not at right angles to the sides. The forcing-houses, which are placed nearly across the middle, stand somewhat obliquely to the sides, and have almost a full south aspect. The roofs, fronts, and ends are composed mainly of iron, the bars of the sashes being of copper. Although built at a time when metal roofs were little known, and much distrusted by some, they have always been found to stand satisfactorily. They were originally all heated by common flues, and were built by Messrs. Richards and Jones, of Birmingham. Comparatively little forcing is now done in them; but we observed a quantity of very excellent greenhouse plants occupying the pit of one of them, and some similarly good stove plants in another. Mr. Ivison, the gardener here, has evidently fallen into the right method of cultivating these; for only ornamental sorts seem to be kept, and each plant is treated individually, according to its character and habits, and made into a specimen.

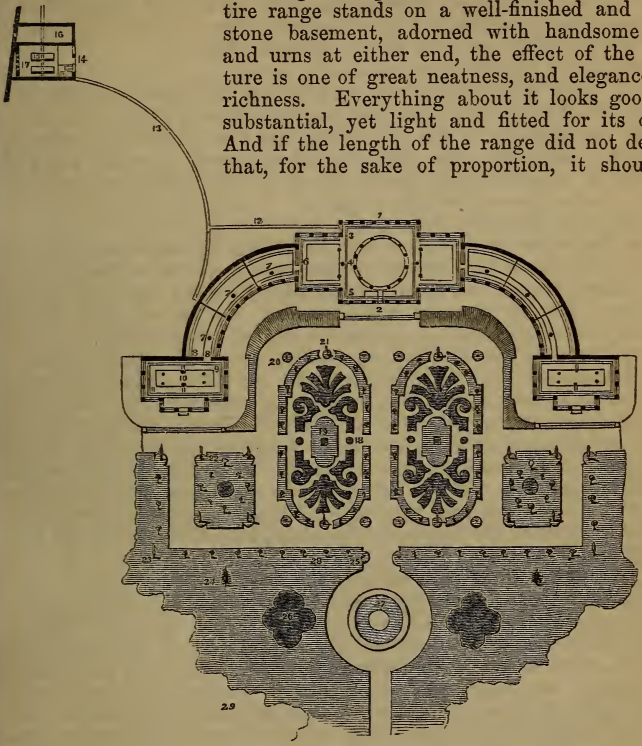
The lily house at the end of this range, which has been enlarged and altered expressly for this plant, is a span-roofed erection, with a porch and second door to prevent the external air from acting on the plant. It contains a slate tank, 21 ft. square, which is occupied principally by the Victoria. The plant flowered here very shortly after that at Chatsworth, and has since continued to bloom and bear seed most profusely, being in the best possible health. It is planted out near the centre of the cistern, and the water in the tank is kept heated, while the atmosphere of the house is maintained at a high temperature. A small water wheel, over which a supply of water is continually flowing, keeps the water in the tank always fresh and constantly in motion. When we saw the plant last autumn it had fifteen full-grown leaves on it, which were a good deal curved upwards at the edges, as in its native state, and several younger leaves were appearing. These latter have something of the appearance of a light-coloured hedgehog or an indented Melocactus, being curiously folded up, and presenting only their prickly under surface to view. Several other aquatics, chiefly Nelumbiums, are grown at the sides and towards the corners of the tank, but are not allowed in any way to interfere with the Victoria.

In a back corner of the kitchen garden, adjoining the lane that leads from Brentford through Syon Park, is the large tropical house. This is a lofty structure, with an upright back wall, and a curvilinear iron roof. It has a glass division in the centre, and contains a collection of tropical fruits which is probably quite unique in this country. Many of the plants are very large, and as they are kept in a rather high temperature, with an abundance of moisture, all of them appear healthy. Several things have, we believe, fruited here which have not borne fruit anywhere else in Britain; and many plants which here fruit profusely are scarcely ever seen to fruit in general collections. Indeed, it is pretty well known that this tribe of plants must have a peculiarly high temperature and much moisture, and plenty of room to grow in, ere they can be expected to succeed.



SYON PLANT HOUSES.

In general shape the plant houses at Syon take the form of a crescent, which is a decided improvement on the old straight ranges. The centre of the building, which is broadest, rises into a lofty dome, and the two end houses are also broader and higher than the intermediate parts. The whole of the framework of the roof being formed of light iron bars, and the ends and centre being stone pillars and cornices, while the entire range stands on a well-finished and raised stone basement, adorned with handsome vases and urns at either end, the effect of the structure is one of great neatness, and elegance, and richness. Everything about it looks good and substantial, yet light and fitted for its object. And if the length of the range did not demand that, for the sake of proportion, it should be



SYON FLOWER GARDEN.

References to Syon Conservatories.

The centre division has 17 four-inch cast-iron pipes below the paths and all round.

1. The steam from the main.
2. Condensed water outlet.

The two square divisions, adjoining the centre one, have 14 four-inch pipes round three sides of each.

3. Steam entrance.
4. Vapour valves, for steaming the house.
5. Condensed water outlet.
6. Steam entrance.

The other curved divisions have five pipes in front, and four at the back of each division.

7. Vapour valves.
8. Condensed water outlet.

The end divisions, forming the extreme wings of the range, have eight pipes all round.

9. Steam entrance.
10. Vapour valves.
11. Condensed water outlet.
12. Main.
13. Main from the boiler conducted in the wall.
14. Boiler house.
15. Boilers.
16. Coal shed.
17. Chimney, divided into four flues, to cut the column of smoke.

Flower Garden.

18. Compartments of beds (for low flowers), edged with box upon gravel, and circumscribed by a grass verge, planted with dwarf standard roses.
19. Large vase and pedestal, upon a grass plot.
20. Small vases, on circular grass plots.
21. Small junipers.
22. Irish yew.
23. Cypress.
24. Auracaria imbricata.
25. Yucca gloriosa.
26. Hybrid rhododendrons.
27. Fountain.
28. Standard roses.
29. Rock, &c.

kept as high as it is, the various houses would be by no means ill adapted for growing and preserving plants. The two end portions of the building, which has many glass partitions, are of a somewhat square figure, and are used as conservatories, for containing such large plants as orange-trees, camellias, brugmansias, &c., with a few showy flowers set among them to create a little gaiety. They are without stages, and the plants stand about in groups on a paved floor.

In the front of this range of plant houses is a flower garden, the shape of which seems rather appropriate to a building in the form of a crescent; there is also a basin and fountain, with a group of dolphins forming the pedestal of the jet. There are rows of standard roses by the sides of the walks, and the beds, which stand on grass, are each furnished with only one species of plant. A walk strikes off from the fountain in the direction of the house.

On the lawn at either side of the flower garden, where the area in front of the houses is extended into something like an oblong figure, there are several good specimens of the dwarfer and rarer shrubby and half-shrubby plants. We noted *Aralia spinosa*, which was just coming into bloom last autumn, as a lawn plant of great character; and *Mahonia fascicularis* seemed to stand out well as a hardy bush.

On the northern side of the house, which is a plain heavy structure in the Gothic style, with battlements round the edge of the roof, there is a small bare lawn, having a sunk fence to separate it from the park, and a few bushes along the inside to cover the fence. At either end of this line of fence, a small square lodge is placed, though by no means harmonizing with the style of the house. A public footpath exists through the park on this side of the house, and is separated from the estate at the Isleworth end, by means of large upright revolving iron gates, which answer the purpose of turnstiles, but at the same time form a fitting part of the large general gateway.

The drive through the park towards the lodge in the Hounslow Road crosses a small strip of water by a raised iron bridge, in a part where it takes a considerable curve, and the extreme slenderness of this bridge, its want of architectural character, the sudden rise in the road to get over it, its occurrence at such a sharp turn in the drive, and the absence of all support or concealment from trees or bushes on the side most needing it, render it one of the most awkward things imaginable. Between the bridge and the house, there is a short and good double avenue of limes. Near the side of the water are admirable groups of deciduous cypress; and in other parts of the park the old thorns are truly splendid, having acquired quite the character of trees. Groups composed entirely of the common Acacia exist on the westerly side of the park, and are highly picturesque. There are also some extremely beautiful low spreading horse-chestnuts and noble hop-hornbeams between the bridge and the entrance lodge, as well as in other parts. The short piece of drive, and its park-like accompaniments, from the entrance lodge to the bridge, are, as seen in going towards the house, of the best description possible on so flat a surface.

Bedford Lodge, the residence of the *Dowager Duchess of Bedford*, is situated at Camden Hill, Kensington, in the immediate neighbourhood of Holland House. It affords a very interesting illustration of how much may be done in a small suburban place, which has many disadvantages of position, by carefully working in all those features of the neighbourhood which happen to be favourable, and by a well-considered arrangement of the space actually belonging to the estate. Although containing little more than four acres of land, and lying so near the thickly populated district of Kensington, and having a public lane and road on two sides of it, with another villa and garden adjoining it on the east, and an atmosphere which is, of course, an almost exclusively London one, the gardener here has contrived to make it into a most delightful summer place, with a great deal of variety in it, and some very artistic effects.

Wimbledon Park, the present residence of the *Duke of Somerset*, but once the property of Earl Spencer, is in one of those admirable situations which are rarely met with so near town. The house, which is an unpretending structure, is situated a little to the east of Wimbledon Church, and it and the gardens command some of the best home views and distant prospects which are to be found around London.

A walk round the pleasure grounds here, on a favourable day, will furnish a multitude of most charming landscapes, especially to the north-west and south-east. It is said that no less than thirty churches can be seen from different points in the grounds. And though such a circumstance is not in general to be taken as an absolute criterion of merit, yet in this case it affords a good indication of the style of the scenery; for, being only ten miles from London, churches are of course the centres of population, and the numerous detached villas and clusters of houses which are dotted about through this richly-wooded scene, at once afford an evidence of habitation and of social life, while they picturesquely vary the aspect of the country. Nothing can be more effective in a landscape that is sufficiently rich in trees than the groups of dwelling-houses or isolated villas which jut out here and there over the face of a district around the village church, provided these do not come too near the eye, or take a too prominent position, and that the scene is broad enough to keep them duly subdued. And when, as in this instance, the surface of the country is greatly varied, being thrown up into occasional swells or ridges of hills, or expanding into a wide and winding plain—the buildings now occupying the face of some of the hills, and now being gathered together in a valley, or peering out from a tuft of noble trees in either position—the entire scene becomes greatly enriched by such objects.

On the north-western side of the garden, a short terrace walk, at the edge of a steep bank, overlooks some of the chief features of the park. With a few tufts of thorns as a foreground, and a screen of larger trees to support and confine the view, there is here presented a rough and broken bank sloping along into a hollow beneath, in which last a portion of the large lake is visible.

Kenwood, the seat of the *Earl of Mansfield*.—This place has the great advantage of being situated between the picturesque hills of Highgate and Hampstead, embracing some of the intermediate heights, and nearly the whole of the beautiful intervening hollows, with their softly-rounded and various undulations. From this circumstance, and because it commands excellent views of Highgate Hill and church, the grounds would necessarily be pleasing. But they are further and more markedly distinguished by their extraordinary masses of wood, which are principally made up of oak. These, occurring over the face of the various swells on the southern side, and also on some parts towards the northern boundary, and being so very dense as to grow together into broad masses, the upper surface of which is only relieved by the changes in the ground itself, and by the slightly-different heights or tufting branches of individual trees, compose, altogether, a unique and highly sylvan landscape, which acquires much interest, beyond its own intrinsic attractiveness, from being so close to London.

The abundance of oak trees throughout this estate is supposed to have imparted to it the name by which it is now known; *kern*, which has been corrupted to *ken*, being the old British word for an acorn. The oak woods are also considered to be of spontaneous growth, and are therefore doubly pleasing. Mr. Loudon once thought they were composed of the *Quercus sessiliflora* alone; but they have since been found to comprise a great deal of the *Q. pedunculata*, and a number of varieties apparently intermediate between the two.

Holland House is the London residence of *Lord Holland*, and stands about midway between the Kensington and Uxbridge Roads, a little to the west of the more densely populated parts of Kensington. The house is well known as a fine example of the ancient English mansion, and is rendered classic by having once been in possession of Addison, the essayist and poet, who wrote his *Spectators* in the library here, while the early days of Charles Fox were also spent in this home of his ancestry and family. A public path passed very near the south front of the house till about two or three years since, when it was happily diverted, and his lordship formed another for public use by the side of the park.

In some parts of the gardens here there is much of that quaintness which one would expect to find in connection with so old a mansion, and which becomes an appropriate and characteristic feature in such a position. The flower garden, for example, is laid out with that intricacy and minuteness of pattern so common to ancient parterres, and all the beds are edged with box. At the corners of the beds, in some parts of the figure, the box is allowed to grow larger, and is clipped into the shape of a ball. In other parts, dwarf evergreen oaks, not more than a yard in height, are similarly clipped into globular shapes. The pattern, again, is so minute in other portions that the beds, being too small to admit flowers, are filled with sand of different colours. Others of the beds represent the initial letter of his lordship's title, in the quaint old English character. And near an arbour in the wall which bounds the garden towards the north, and which arbour is dedicated in an inscription by the late Lord Holland to the poet Rogers, who spent much of his time here, there are two beds in the shape of foxes, in allusion to the family name of Fox; and a lotus fountain adjoins these beds. A fine bust of Napoleon, by Canova, partially screened with evergreens, forms the centre of a compartment by itself, at the lower end of the flower garden. A long scroll of beds, filled with verbenas (one variety being placed in each bed), ranged along the side of the principal walk down this garden, looked very well when we saw them last year. The flowers used in all the beds are judiciously kept of the dwarfest character, that the precise figure of the beds may be preserved, and that the box-edgings may remain conspicuous. The dahlia is believed to have been first introduced to this garden by the late Lord Holland.

There is now a fine bold area on the south side of the mansion, inclosed within the terrace wall. It is paved with stone in the immediate neighbourhood of the building, and there are a few curious old exotic plants growing out of the pavement here and there against the walls of the house. The rest of the area is laid down in grass, with a broad walk around it, and a fountain (the basin of which is of cast iron) in the centre. From this terrace the southern park is seen to be a very plain piece of grass, with some lines of elm trees down either side of it, and similar trees extending partly along the side next the Kensington Road. The site of the house is, however, fortunately high enough to afford views over the tops of the houses in the front of it, and across various tufts of trees in the neighbourhood, to the Surrey hills. The entrance to the place is by a neat gateway from the Kensington Road, up an avenue of elms. Mr. Scobie is Lord Holland's present gardener.

The Manor House, at Fulham, is the seat of the *Bishop of London*, and is a small but neatly-kept place, in so flat a district that the views are confined to its own grounds. Nearly everything in the gardens here is good of its kind, though there is nothing conspicuously so. The kitchen garden is well cropped, and has excellent fruit trees, of nearly every class, on its walls. There are three forcing-houses here, heated with hot water, by the father of the present Mr. Weeks, of Chelsea. They are used as vineries, but a few plants are grown on a stage in the central one, and when they were visited last autumn, some pines were also placed in a pit belonging to one of them.

In the vineries, Mr. Hay, the gardener, adopts the plan of growing two crops of grapes from one house every season, and has experienced a very satisfactory amount of success. The plan pursued is to train the earliest vines to upright trellises, which are nearly as high as the roof of the house. When the grapes on these are sufficiently coloured to be able to dispense with a portion of the light, the other set of vines, growing in the outside borders, and previously trained to the exterior of the rafters, is introduced and fastened up to the rafters, and the two crops then receive the same treatment. The first crop is brought on as early as possible, being generally cleared off by about April; and the second crop is of course an autumn one. The latter consists mainly of black Hamburgh and black West's St. Peter's grapes; but there are a few of the white sweetwater and muscat of Alexandria kinds.

Pines, of which no great quantity is grown, are very well cultivated here, in pits, and appear most healthy. Some cucumber plants were likewise growing very favourably, last autumn, in a small pit.

In the pleasure grounds, at the garden front of the house, there is a good open lawn, bordered with a few beds of flowers; and a walk to the kitchen garden has also some flower-beds on the grass at each side of it, with two rows of standard roses. There is likewise a small American garden, well filled, with *Magnolia purpurea* and *cordata*, &c., growing out of the masses of rhododendrons, and greatly enlivening and varying their appearance in summer. The beds in this garden are so small, and the plants have grown so spreading, that many of the latter have to be cut into a complete hedge by the sides of the walks.

Lord Tankerville's villa, at Walton-on-Thames, is one of those happy examples of architectural treatment which are all the more delightful because they are so extremely scarce. It is in the Italian style, and was designed by Mr. Charles Barry. We know of no instance in which the pictorial effect of the building has been so successfully studied, and its offices and accessories made to play so unobtrusive but important a part in the general composition from the garden front. Unfortunately, the place has been suffered to fall into a very neglected state for the last few years; and, probably, ere this notice appears it will have passed into other hands.

The garden attached to this villa has very little in its situation to recommend it. The country around it is flat and tame for the most part, and the river with a swampy margin. A towing-path also passes between it and the river. It has therefore to depend mainly upon itself, although the river, in some parts, is sufficiently below the level of the garden to render the view of the former pleasing. It likewise takes in a small portion of the wooded hills of the Oatlands estate. But the proximity of the public road (although this was a good deal diverted at no very remote period), and the nearness to Walton Bridge, cause the place to be crowded up with trees on two of its sides. Between the house and the river, especially, the trees so press upon the building, and so narrow the garden, that the effect of both is greatly marred.

Entering by a plain Italian lodge, and passing the stables on the right, a few paces bring us to the entrance porch, which is beneath a belvidere tower. A fine cedar tree, standing close to this tower, with a retiring wing of the building, and a small architectural flower garden behind, form altogether a group such as is seldom seen; and a few other cedars on the adjoining lawn greatly help the effect. The flower garden is in a corner formed by the retirement of part of the building behind it, and the projection of the tower at one end of it. It is inclosed within a balustraded wall, decorated with vases, and is on a slightly-raised platform, the whole being in excellent keeping with the house.

At the eastern side of the house, the garden stretches away, along the top of a bank, by the side of the river, being backed by the village of Walton and the kitchen garden on the south. A rather plain wing wall extends from the house to the kitchen garden, inclosing all the offices. From the lawn on this side of the house, however, the roofs and various small towers of the outbuildings, with the house and its scarcely seen tower, and the trees, produce another admirable picture, which is particularly noticeable for the variety of outline and unity of character it presents. The roofs of all the buildings being covered with the broad tiles having raised ridges, expressly made for structures in the Italian style, even the commonest outbuildings possess a certain richness and character, and harmonize well with the principal edifice.

Oatlands, which is only a little higher up the river than the place just described, was laid out by Wright, a successor of Kent, and had formerly a great reputation. It possesses many good features, the principal of which are its water and its grotto. The water, which lies in a valley to the north-west of the house, is considered a clever imitation of a river, and might, when in proper preservation, have been mistaken for the Thames. The grotto is an extraordinary one, built by Bushell (a celebrated constructor of these things) for the Duke of York. Its formation is said to have occupied many years. It is of considerable size, and is lined chiefly with shells, spar, and similar materials, so as to have a very artificial character. It is more a curiosity than an object of art; the rules of art demanding that the material employed for these things should be of one general kind, and that they should be such as are found in nature, or might possibly be so. At one period, however, this grotto possessed considerable fame; and there is a tradition that it was once occupied by a sort of congress of kings. In a secluded spot around the grotto is a very singular collection of tombs and memorials to the Duchess of York's dogs. These animals seem to have been great favourites; and there are considerably more than a hundred monumental stones, of various shapes, on which the virtues of the different pets are set forth and their fate mourned, in several languages, and sometimes in the poetical effusions of eminent personages. The park contains much fine timber: but the greater part of the estate is now, we are told, to be carved up into building plots for villas.

Dropmore, the seat of Lady Grenville, is about six miles from Windsor, and a little beyond Burnham. Although it scarcely comes within the range which we profess to include in our descriptions, it ought to be mentioned on account of its well-known Pinetum, which is probably the best and the most interesting in Britain, having been in existence so many years; while its extensive flower-gardening decorations are also celebrated.

From the front of the house some fine prospects are obtained through the bold masses of trees on the lawn, the land dropping away suddenly after presenting a sufficient foreground. The views take in Windsor Castle and the hills and woods of Windsor Great Park, with the valley of the Thames spreading out between.

Parallel with the front of the house, the flower gardens extend for a considerable length to the west, and are backed by an architectural wall, and by conservatories, aviaries, &c. Being on a flat surface, a good opportunity is afforded for massing flowers of one colour, and this system is largely adopted. A good deal of variety and richness is produced by the use of vases, sculpture, large china jars, fountains, baskets, &c. There is also a Dutch flower garden, used chiefly for bulbs. On the wall at the back, too, there are many beautiful climbers; and standard and pole roses are freely used in the decoration of this part of the place. Here are likewise some magnificent plants of *Magnolia grandiflora* and *Stuartia virginica*.

Knowle Park is the magnificent seat of *Earl Amherst*, at Sevenoaks in Kent, and has come into his lordship's possession by marriage, having formerly been the family residence of the Dukes of Dorset, and once belonging, it is said, to Archbishop Cranmer. Although 24 miles from London, it is such a noble old place that it requires a brief notice here.

Situated in a very charming country, with all the ground softly and beautifully undulated, and enriched with the most splendid wooding, this park embraces some of the best features of the district, and is for the variety of its undulations, and the magnitude of its trees, equalled by very few others. The beeches are particularly grand; and there are many picturesque old oaks, among which one, which is now dead and partially decayed, is fenced off for preservation, as being of gigantic size both as respects height and girth. A very delightful winding valley, having the top and part of the sides of its slopes picturesquely clothed with old trees, stretches across the park near Sevenoaks, and is crossed by the drive that enters the park in the middle of the town. Some agreeable walks wind among the trees at the top of these slopes, and the public are liberally allowed access to them and to other parts of the park.

The mansion is an exceedingly venerable old pile, for the most part erected in the fifteenth century, though some portions are still more ancient.

It is regarded as a very fine specimen of the castellated baronial hall, and is in the form of a quadrangle, with a spacious inner court. Regarded pictorially, it presents many attractions, and the rich clothing of ivy with which it is partially adorned greatly heightens its beauty. On the garden front especially, the ivy, by being closely cut in, forms a smooth and luxuriant mantle to the building, without interfering with any of its architectural features, or conveying the idea of wildness and neglect.

To the lover of the picturesque, the private garden, with its ancient terraces, parterres, and sculptured ornaments, its long green alleys broken occasionally by overarching climbers or evergreens, and its numberless ancient specimens of exotic shrubs and low trees (the cypress, juniper, and arbor-vitæ tribe, and the yews, being particularly prominent, and huge Magnolias being also numerous), will afford a rich and unusual treat. Most of the plants having been permitted to take their natural shapes, and some of them to mingle together in groups, the great age of many must of course have contributed to produce the most irregular and picturesque specimens, as well as most artistic combinations. Besides other strange and striking examples, there is an old lime tree on one of the lawns, the branches of which having naturally bent downwards towards the earth, have there struck root, and it is now surrounded with myriads of tufted trees of various ages and sizes, covering altogether an immense surface. The parent plant is, indeed, beginning to decay, and some of its numerous progeny are nearly as large as itself. Around the same stem a sort of natural bower is formed, from which there are many little winding avenues to the outside, realizing most perfectly the picture of the Banyan, and its

> "Pillar'd shade,
> High overarched, with echoing walks between."

Mrs. Lawrence's gardens at *Ealing Park* have acquired, and justly, a universal reputation, on account of the superb collection of plants which they contain, and the general taste displayed in the arrangement of the place. As they are most generously thrown open to the public for one day in each week during the summer, they demand to be pretty fully described.

The entrance to the park is at the eastern corner, and after passing through the gates, the drive turns to the left, and crosses the open park till it reaches a long piece of artificial water, over which it is carried by a low bridge, which is in fact a neck of land dividing the lake into two levels, and soon arrives at the house. There is also a walk from the lodge to the house, just along the belt of plantation which covers the northern boundary. In the lake is a pretty island of weeping willows, which shows well from the house. The drive, walk, water, &c., were planned by Brown; but the southern belt of plantation was afterwards thinned out with great judgment and effect by Repton, who saw that it was concealing the views into the country across the Surrey Hills, and of the Kew Pagoda, gardens, &c., and caused several varied openings in the line of plantation to be made, thereby greatly enlivening and expanding the place.

From the house, which is so unfortunately contrived that the offices are on the south side, and can only be gained by passing the principal entrance door, an opening through an architectural wing wall at the north end brings us at once into the pleasure grounds. This wall is also used to connect the house with a conservatory, which stands on the right as soon as the garden is entered, and is generally filled with Camellias, or other large flowering plants that are not grown as specimens.

At the other end of the house, a short colonnade is thrown out, and supported by low evergreen trees, through which access to what is called the "Italian walk" is given. This is a straight walk, on a descending slope, with pairs of small figures on pedestals at either side of it, and good specimens of Irish yew between these. It terminates in a moderately large circular basin of water, in the centre of which, on a sufficient pedestal, is a figure of Apollo. The walk is kept confined towards the end by large evergreens, which narrow the vista, and confine the view pretty much to the principal terminating object in the middle of the basin. The figures on the pedestals at the sides are arranged in pairs; on one pedestal Mars and Venus being placed, on another Cupid and Psyche, on a third Castor and Pollux, &c. The general effect is classic and elegant, and consistent with the style of the house.

The lawn view from the front of the house is rich and varied. A great many specimen plants, especially of the coniferous tribe, are scattered about upon the grass, and their lower branches lie down upon it in the most graceful manner. A rustic arch, through which a small fountain is seen, and some fragmentary classic ruins, jut out from the mass of trees and shrubs at different points along the northern boundary, and prevent the abundance of green vegetable objects from degenerating into sameness. Certain cross avenues, however, break up the principal glade more than is desirable. One of these avenues is of *Cupressus macrocarpa*, backed by mixed evergreens. Near the house, among other choice specimens, is a large plant of *Arbutus procera*, which, with its smooth stems, and fine clusters of fruit in autumn, has a striking appearance. *Garrya elliptica* is also large and handsome, and is a most valuable shrub for winter flowering.

When the basin of water is reached, it is found to contain four other figures on pedestals, one of them representing Neptune, another a mermaid, and the remaining two herons. On the east and west sides of this pond, the ground rises into a bank, with large masses of evergreens on the summit. The bank to the east is the highest, and has a splendid cedar of Lebanon upon it, the branches of which are held up by ivy-covered props, so as to allow of its being walked under. Close to this bank is the dairy, a pretty object, and decorated inside with a row of busts on brackets against the upper part of the walls, with flints, shells, &c., on part of the shelves. The door is of stained glass, with wreaths of roses and other flowers.

In the neighbourhood of the dairy, under the large evergreen trees, is an oval arch, formed with masses of fused brick, and supported on either side with a miniature rockery of the same material, clothed with ivy, &c. The design of the aperture is to afford a sudden and confined view towards the park, embracing part of the lake, on the margin of which latter some masses of fused brick have been set up to form an object to this view. Were the scene more definite and contracted, and did it embrace one principal and striking feature, it is probable that this idea of an oval opening, which starts from the level of the ground, and is about the height of a full-grown man, would be very effective, by yielding a kind of telescopic view without the awkwardness and trouble of having to approach so closely to a smaller aperture, or to move about with effort in order to obtain the desired survey. A better example occurs on the other side of the round pond, where, after threading our way amongst large laurels and other evergreens, which group themselves into a natural retreat called the Leicester bower, and turning at length between shaded masses of fused brick, which furnish a shaded home for ferns and alpines, we come all at once to another oval aperture, through which we look out to the pond and its figures, with the grassy bank and noble evergreens beyond. Here there has been more preparation, by a winding and uncertain path, in deep shadow, among imitation rocks, of which the arch forms a part; and the burst of light which we suddenly obtain through the arch, with the limited nature of the view, and the existence of a more definite object in the pond and figures, render this much more satisfactory, and, indeed, decidedly artistic.

We cannot but remark on the felicity with which the oval figure has been chosen for framing these little scenes, and how well the shape and size of the aperture fulfil its intention. Any more irregular opening would have the effect of scattering too much the objects to be revealed, whereas this serves to concentrate and confine them. A circular aperture, again, would produce the same bad result as an irregular one, unless it were quite small, when it would have to be looked through with effort, and the whole scene would be taken in only by degrees. The oval, on the other hand, as here adopted, is in itself a beautiful figure, and directly the eye catches it, all that is wished to be seen through it is exhibited at once. The suddenness with which the view opens upon us is fully half of the charm. Any gradual unfolding of the scene would ruin it.

Following the walk which runs along the boundary of the pleasure grounds, we see how nicely these are separated from the park. A very low hedge is placed in the bottom of a hollow, and its line is broken by a few dwarf evergreens, such as Rhododendrons, scattered here and there irregularly along the inside. Standing on the walk, therefore, or the lawn, we scarcely observe this boundary line, because it is so low and unobtrusive, and does not at all arrest the sight, while it is quite hidden from the other side of the place.

A walk through the plant houses supplies continual food for wonder and admiration. The conviction is pressed upon us at every step that the power of cultivation "can no further go." And everything is done with a liberality as to space and conveniences which is quite of a piece with the fame of this establishment. The well-known success which attends the exhibition of plants from this place at the great metropolitan shows, will no longer be matter of surprise after the collection is seen. The only occasion for astonishment will be that any other competition should ever be able to carry off the highest prize.

At the front of the principal group of plant houses is a somewhat square area, arranged as a flower garden, and having little wire temples, as supports for climbing roses, at the corners. Walls covered with climbers inclose it at the sides, and the charming *Clematis montana* is among the most conspicuous plants on these walls. There is a fountain in the centre, and some vases are placed about in parts, while masses of stones at the base of the buildings, and in front of them, receive a variety of pretty trailing and alpine plants. The flower-beds are cut out of the grass, and are each furnished with a single kind of plant, in the usual manner.

Gunnersbury, the seat of *Baron Rothschild*, is also at Ealing, about half a mile nearer London than Mrs. Lawrence's place. It is a retired and elegant villa, very agreeably situated. The house stands on the top of a sloping bank, which affords an excellent opportunity for having an Italian terrace on the garden front. This terrace is particularly well treated, having a low wall with vases along the front, and being entered upon at one end by an enriched arch, attached to the house and supported with trees, while the other end is finished by a handsome alcove, containing a statue of the Apollo Belvidere.

From the terrace walk there is a pleasant view across a lake in the low ground and the small park to the woods and low hills on the Surrey side of the Thames; everything in this scene being rich and accordant, and the whole being very nicely framed with old trees.

A walk to the westward from the terrace conducts us along the side of the open park, where we soon arrive at a pleasing recess, in which is a marble statue of Eve at the fountain. This is very artistically embowered with ivy, and is so far kept out of sight till it is approached as to convey the idea of being a shaded and sacred nook, into which the living mother of mankind, represented in the figure, might have retired. Two tall and fine cypresses stand by the side of this recess, as if keeping a kind of guard over its sanctity.

A little further from the house there is a nearly circular piece of water, open towards the park on one side and surrounded with noble trees in other parts. Both the lakes are supplied from a spring on the estate. This portion of the grounds was arranged by the celebrated Kent. The formality of the outline of the water is now slightly broken by the branches of some of the trees dipping into it. There is a very fine tulip-tree among the other large specimens, and a cluster of excellent cedars. Here, as elsewhere under similar circumstances, it will be noted that a wooden platform, for the purpose of using the boat, is thrust out into the water several yards, and has an exceedingly prominent and disagreeable appearance; which might easily be obviated by deepening the water at any particular point along its margin, and making a small landing-stage to follow precisely the line of the water's edge.

By the side of this piece of water, in the midst of the group of cedars just mentioned, is a classic temple, from the front of which there is a beautiful view over the water, the park, and the country. The interior of this temple appears to be used as a billiard room. It contains at present, however, a most interesting collection of stone figures, illustrative of the "Beggar's Opera," which formerly stood in the open air, but had unfortunately become so injured by exposure that they are now placed here. They are by Thom, the well-known Scotch sculptor of Tam o' Shanter and Souter Johnnie, and are among the greatest *notabilia* of the place. Although executed in sand-stone, they are taken from life with the utmost minuteness of detail, the tatters of the garments, the patches (some placed beneath and some upon the older parts of the clothes), the holes and mendings of the shoes, one of which has the sole coming off, and even the very stitches, with their customary want of neatness and concealment, by which the various attempts at preserving some degree of soundness are effected, are all represented with a wonderful fidelity and power. But the expression of some of the countenances is still more striking. In the face of the old soldier, with his wooden arm and leg, who has taken on his only knee the old woman whom he loved in youth, and holds her with his single arm, there is a marvellous expression of resuscitated voluptuousness which is almost more than responded to in the cunning but inviting looks of his ancient companion. The ferocity, too, of the stalwart tinker, who is taking his revenge on the terror-stricken and crushed little fiddler for supposed wrongs done to his wife, is most admirably depicted. There is, indeed, a spirit and a truthfulness about these objects which makes us regret that the unhappy artist did not use less perishable materials, and that he was not more cordially encouraged.

At the north side of the temple containing these figures is a small circular flower garden, surrounded with festoons of climbers, on a wire frame, and nearly beneath them is a low iron trellis covered with China roses. This flower garden is very nicely furnished with plants in the summer, and the beds are not too crowded. In its neighbourhood there is an immense plant of *Magnolia grandiflora*, which is quite like a tree, and many beautiful specimens of various other low trees. Gunnersbury is rather famed for its large orange-trees, which are kept in an orangery in the lower part of the pleasure-grounds.

Mrs. Marryatt's, Wimbledon House, has been elaborately and pictorially described by Loudon, and, like Mrs. Lawrence's, is open once a week to the public in the summer season. At one period, too, Mr. Redding, the gardener, was a very successful exhibitor of plants, and a great many highly ornamental species were first introduced to this place, and originally flowered here. Latterly, however, less attention has been paid to maintaining a high horticultural position; the trees all over the estate have become crowded, plants are very rarely grown for the exhibitions, and scarcely anything is conducted with the same spirit as formerly.

This estate, which comprises about 100 acres, is close to the delightful village of Wimbledon, and embraces some beautiful undulations of surface, charming views across Wimbledon Park, and, in one part, a very rich piece of the river Thames, with much of the valley through which part of the Thames flows, and the hills of Middlesex and Harrow in the distance. Although beautifully placed, however, and presenting some good natural features, the artist who designed it has by no means made the most of it; and now that the trees are becoming crowded, the defects in the plan are more conspicuous.

The house, which is very ample and complete, is rather too near the village, and hence the drive is a little too short for a place of this extent. Were the house farther away from other dwellings, and did we not see it directly we enter the gates, the shortness of the drive would be, as at Kenwood, an advantage. There is a conservatory attached to the house, in which, besides many sculptures and other ornaments, is one of the first plants of *Jacksonia pinnatiscipula* which bloomed here before flowering anywhere else in England, and still covers the roof of the conservatory.

From the garden front of the house there is a good view across the park to a sheet of water in the hollow, and over the trees behind this to a wooded hill beyond. Besides a few effective groups of trees, a charming specimen of an old variegated holly, covered with ivy, stands in the park in front of the house. A walk to the right then carries us through a strip of pleasure ground on the north side of the park, and amongst some very large and varied evergreen oaks, and tufts of hollies, Portugal laurels, rhododendrons, &c. There is, in one part, a small hollow nearly filled with rhododendrons, which are now large and picturesque. There is also a gigantic single plant of the common rhododendron.

At the bottom of the walk just spoken of we arrive at the lake, near the corner of which, on an island, are the remains of a chapel, once much used by the Prince of Condé during the time of his residence here. This island is approached by a bridge, now picturesquely covered with ivy; and from the midst of the other trees which are growing on the island, two or three Lombardy poplars rise, and the whole form a most beautiful group. Unhappily they are now decaying at the tops, and will soon have to be removed. A walk to the north-west from this point leads round the boundary of the place, through what is called the wilderness, where there are some fish-ponds. Another piece of water is seen in the hollow below the larger lake. Skirting the lower margin of the principal lake by a green path, backed with trees and evergreens, we first pass an enormous beech tree of the noblest character, and afterwards, near the western end of the lake, come to a fine ivy-clad oak, and the original specimen of the *Magnolia*. It is from a point near the northern end of the lake that the view of the Thames and its valley is to be caught, and this, on a fine day, is one of the most delightful kind. Some of the principal London buildings are also embraced from this spot.

At the south-western end of the lake there is an iron bridge. The walk to the right from this bridge takes us through a thin covert of trees of no particular character, by the side of a narrow winding continuation of the lake, till we merge into another open part of the park, by the side of which, with charming scenes across Wimbledon Park, we pass to the grotto. This structure takes the exterior form of a small temple, from the front of which the landscape is very sylvan, varied, and lovely.

On entering the door of this apparent temple we are astonished to find ourselves in a grotto, built by Bushel, after the manner of that at Oatlands, and lined with similarly unnatural materials. Parts of this grotto, however, where spar only has been employed, and where the surface is broken up into a variety of intricate little cells and recesses, are good. A small aperture at the back, glazed with yellow glass, exhibits the branches and leaves of the plants behind it in a curious colour; and no doubt some really desirable effects might be produced in this way by the employment of a more fitting colour. As a *grotto* this building is, in the main, most unsatisfactory; and the mixing up together of the grotto and the temple is strangely incongruous.

The gardens of *A. Palmer, Esq.*, at Cheam, are only a short distance from those of Sir E. Antrobus, on the other side of the village. The two places possess much the same character, and similar classes of plants are cultivated in them, especially Cacti and Azaleas. With both these latter tribes the collection is well furnished; and although the houses are more commodious, and the plants less numerous, than at Sir E. Antrobus's, Mr. Falconer, the gardener, turns them out a good deal at the end of the summer and during the early autumn. A new seedling *Azalea* has been raised here by Mr. Falconer, and called Bianca. It has perfectly white flowers, which are large, and of a good shape, being much superior in every respect to the old *A. indica alba*.

One of the houses here has lately been fresh glazed with rough plate glass, the panes in the upper lights being joined at the ends by being cut very square, and not at all overlapped. It is not yet ascertained whether this mode of glazing will keep out wet; and it is exceedingly probable that, from the almost necessary imperfection of the joints, it will occasion drip. It certainly looks neat, and saves just a small quantity of glass.

In the stove, some old plants of *Remanthera coccinea* are made to bloom freely every year, by hanging them up near the glass, and keeping them almost dry, during the latter part of the summer. Treated in this way, the plants themselves look a little yellow, but their showy flowers more than repay the diminished verdure of their appearance.

Much attention is given by Mr. Palmer to growing and preserving the different kinds of fruit, and the apples, pears, &c., are all good, and are stored with great care. Some of the older kinds of apples are also to be found here in their genuine state. Down the middle walk of the kitchen garden, various plums are grown upon a wooden trellis, which is arched over it. The plan answers very well, and saves space, besides making the walk into a sort of bower.

Nonesuch, the seat of *W. F. G. Farmer, Esq.*, nearly adjoins Mr. Palmer's estate, but is a more extensive domain, with an ample park, and good pleasure grounds. The property has for many years been noted as having supplied the site of one for Queen Elizabeth's palaces, which had fine old terrace gardens attached to it. Scarcely a relic of these now, however, remain, and the present house is quite on the other side of the estate. A noble elm tree in the park, not far from the supposed site of the former palace gardens, still bears the name of Queen Elizabeth's elm, and is a beautiful specimen.

Towards the end of the eighteenth century, the gardens at Nonesuch were altered to the modern style by Whateley, the author of "Observations on Modern Gardening," whose brother then owned the property. At a subsequent period the house and gardens were entirely removed, and now occupy a position near Cheam. They have been most extensively renovated and improved within the last seven or eight years by the conversion of the old kitchen garden into pleasure grounds, and the formation of a new kitchen garden on the east side of the approach from Cheam.

Entering the estate from the village of Cheam, there is an avenue of Scotch firs leading from a main road to the house, by the side of the garden wall. This avenue is a rare and beautiful object, as the trees have become old, and many of them are very picturesque.

On the south side of the house there is a charming piece of lawn, on which a grand old cedar spreads its branches over a large surface, while many venerable trees inclose a bold and pleasing hollow. Beyond the more immediate precincts of the house, a series of flower gardens, with patches of open lawn and masses of low shrubs and specimen plants, cover the site of much of the former kitchen garden, and are terminated by a raised terrace bank, along the front of a nice group of plant houses. Outside this terrace a pinetum has been formed, in which many of the plants are making a rapid growth, and will soon begin to acquire a good character.

Cambridge House is the residence of *H. Bevan, Esq.*, at Twickenham, just above Richmond Bridge. It is well placed for taking in a near view of Richmond Hill, with its scattered villas and broad masses of wood, while the garden front is not much overlooked from any public road. The pleasure grounds are not large, comprising chiefly a walk and narrow lawn along the front of the house to the kitchen-garden, and having a number of specimen plants and a few flower-beds placed on the lawn. But they lie well open to the park, from which they are only separated by a light fence, and which has thus all the effect of a large lawn. Many fine elms adorn the place in different parts.

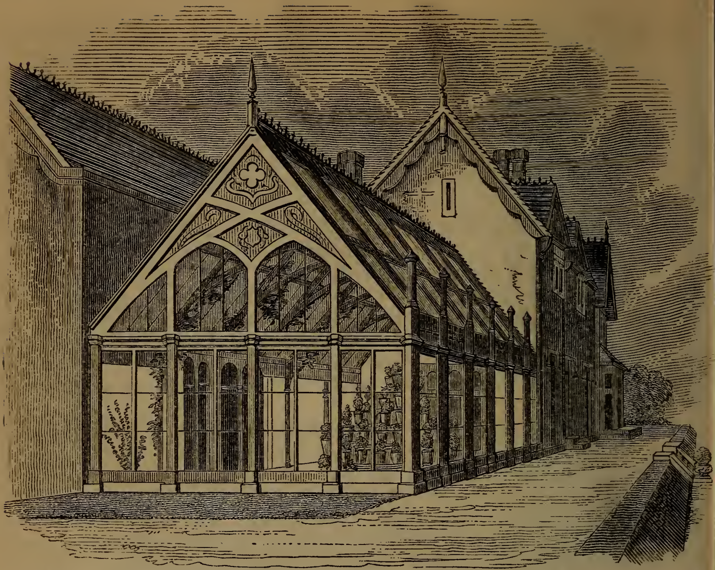
Attached to the house is a good conservatory, in which, besides the usual decorations of plants in pots and climbers trained to the roof, there are many elegant ornaments, such as richly-carved brackets attached to the wall, for receiving conspicuous and spreading specimens, handsome marble basket-like vases, supported on the heads of beautiful marble figures, and filled with graceful plants, and other sculptured marble figures. An air of great richness and variety is imparted by these objects, which nearly always have a good appearance in a conservatory attached to a mansion.

At a little distance from the house, there is a large and lofty greenhouse, or orangery, for orange-trees and other tall greenhouse plants. The roof is covered with vines, which answer well for a late crop. There is another show greenhouse, in which, among some good specimens of ordinary species, we noticed a number of seedling Pelargoniums of bedding-out kinds, and of the scarlet-flowered variegated sorts, and the cherry-coloured varieties raised at Lord Kilmorey's. Several of them are distinct, and will be useful in varying the appearance of flower-beds.

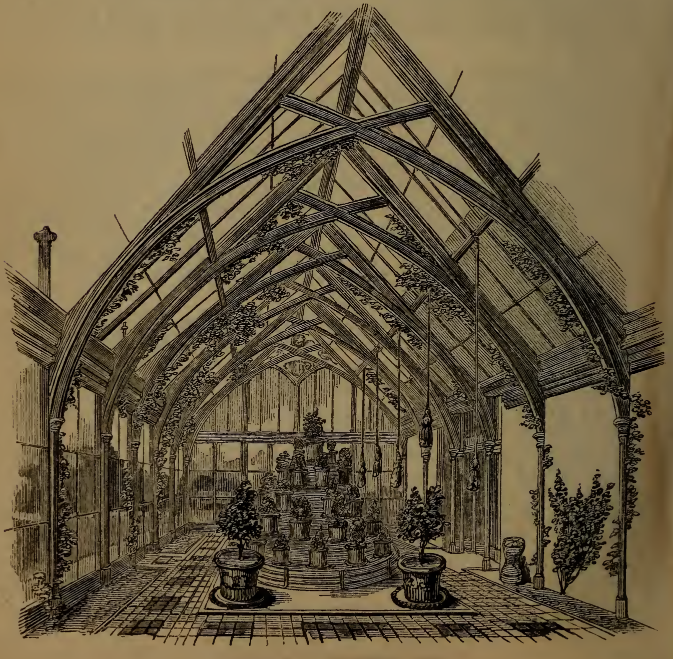
A neat gateway, of open iron work, leads from the pleasure grounds to the kitchen-garden, where there are some excellent ranges of glass, in which grapes, peaches, pines, &c., are well forced, and in a lengthened succession. This department is a good deal attended to, and everything appears to be managed neatly and successfully. The houses are heated by hot water, and the pits, of which there are several ranges for pines, melons, cucumbers, &c., derive their heat from dung linings. In order to prevent the latter from looking untidy, or becoming a nuisance, and to save the heat from escaping, they are all covered with wooden shutters, which fasten down closely over them, and keep them entirely out of sight.

In one of the larger houses there is a nice collection of stove plants, including most of the more fashionable and showy kinds, with a variety of low climbers grown to trellises. Earthenware troughs are placed over the heating pipes in this house, for containing water to produce evaporation. A row of capital hollyhocks was growing in a border of the kitchen garden when we visited the place last October; and this is one of the few gardens near London in which we observed any care bestowed on that very handsome and valuable flower. Its usefulness for planting among low shrubs, or towards the front of new ornamental plantations, to break the outline, is by no means appreciated as it should be. Mr. Pennycook is Mr. Bevan's gardener.

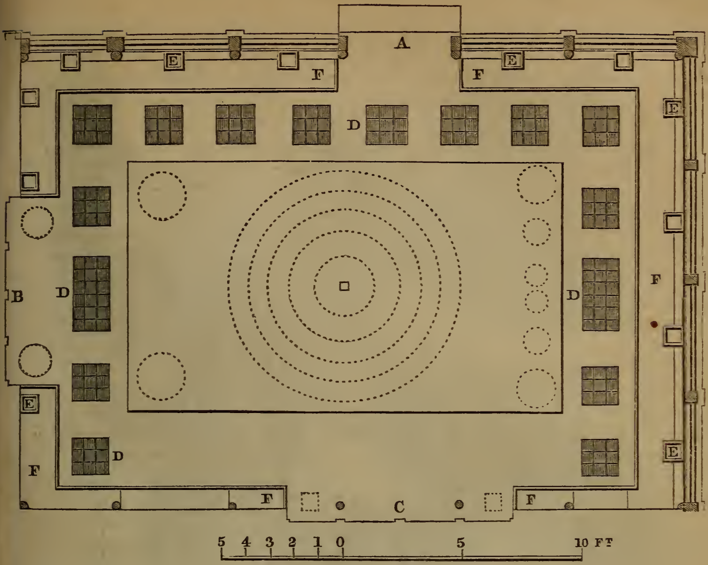
Burntwood Grange, the residence of *H. Grisewood, Esq.*, between Wandsworth Common and Garratt Lane, is a small place recently laid out and planted by Messrs. Rollisson, of Tooting, and the house enlarged and remodelled, and a conservatory added to it, by Messrs. Trollope, of Parliament Street, London. The conservatory, which is in the Gothic style, like the house, we have thought so excellent, that we have obtained permission to give the annexed illustrations of it. Its merits are that it unites and harmonises well with the house, of which it forms a constituent part, and not a mere adjunct; while there is a novelty and richness in the interior of the roof, and a simplicity in the arrangement of the plants, which also recommend it to notice. At a period when buildings of this kind are yet generally such commonplace things, mostly without any style at all, and just tacked on to the house at any point where they may be wanted, without any regard to its harmonising with



EXTERIOR OF CONSERVATORY, BURNTWOOD GRANGE.



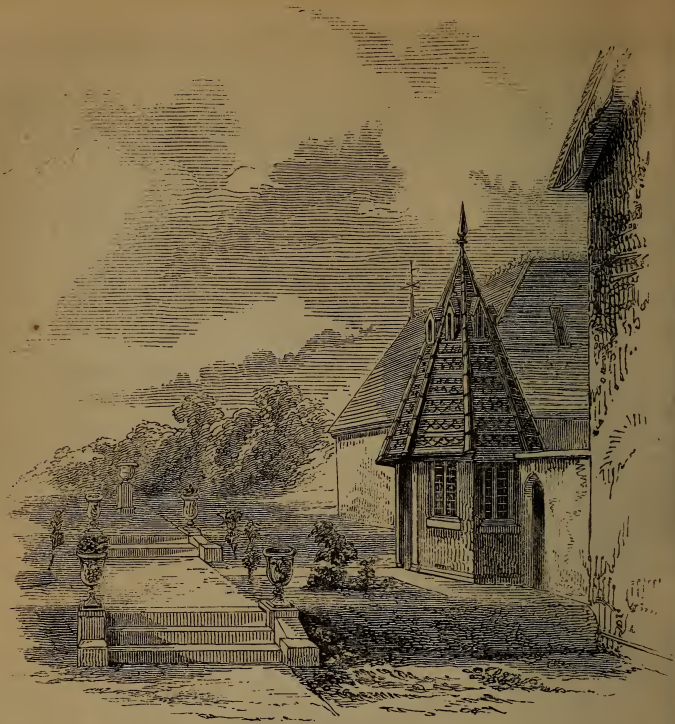
INTERIOR OF CONSERVATORY.



PLAN OF CONSERVATORY.

the design of the principal elevation, a conservatory like this is a pleasant and worthy deviation from the ordinary practice.

Our engravings exhibit the elevation, with part of the house attached, a view of the interior, showing the form of the roof, and a ground plan in which the stages, borders, paths, &c., are delineated. From the first of these it will be seen that the conservatory occupies a corner of the building, where the main wall retires, and is therefore essentially a part of the general structure, not standing out beyond either the front or the end of the house; while the lowness of the roof, as compared with that of the house itself, rather tends to heighten the character of a Gothic building like this. The ground plan will indicate that it is connected with both the drawing-room (B) and billiard-room (C), standing at the end of the former and in front of the latter, so that it can be enjoyed from both. (A) is the entrance from the garden. In the arrangement of the interior, too, regard has been had to the character of art which a conservatory attached to a drawing-room should maintain. Hence, the path is paved with mosaic tiles, the gratings for admitting hot air (D) being of brass, and a neat kerb-stone being placed around the sides of the path. The centre portion is paved with good flag-stones, and there is a light iron stage, of an oval shape, in the middle, while very handsome porcelain vases, filled with flowers, occupy the corners, and also the corners of the path, as shown on the plan. Between the path and the walls there is a narrow border (F), covered with Lycopodiums, Heliotropes, and various low-growing plants, which make a neat fringe to the whole. Climbers are trained to the roof, and a chandelier is suspended from the centre. The main feature in the ground



DAIRY, BURNTWOOD GRANGE.

plan is that the space is not at all crowded, and everything employed is good and tasteful.

Another sketch which we insert represents a pretty dairy at the end of the house, which is appropriately fitted up, together with a series of terraces, with steps and vases, which occupy this part of the garden. At the top of these terraces is a nice span-roofed stove, filled with good plants, and having some novel and ornamental baskets of pottery ware suspended from the roof for receiving orchids, &c. Near this stove is a long flower garden, well filled with various summer plants. The lawns in front of the house are bordered with handsome evergreen shrubs, and there are particularly fine specimens of *Andromeda floribunda*, with a beautiful Deodar cedar. The kitchen garden is well arranged, and contains some first-rate forcing houses and pits. The entire place is kept in the most perfect order by Mr. Hoskins, the gardener.

Pain's Hill, the seat of *Mrs. Cooper*, at Cobham in Surrey, about three miles further from London than Claremont, is a place which contains such splendid features, and has been so much referred to in different works as a grand specimen of modern landscape gardening, that we judged it worthy of a special pilgrimage, and were not at all disappointed. It was laid out by the Hon. Charles Hamilton, son of the Earl of Abercorn, and is said to have been formed from an old common or waste.

The house stands on the summit of a steep slope, at the bottom of which runs the river Mole, and a bold stone bridge, which carries the Portsmouth road over the river, forms a conspicuous and effective object from the house. As viewed from this bridge, too, the house itself has a very imposing appearance, its handsome portico, erected by Mr. Decimus Burton for a former proprietor, rising to the full height of the building, and being supported by massive pillars. It is also well furnished with large trees on either side, while the slope of the park in front is open enough to show all its beauty and breadth, while it is sufficiently studded with specimen plants to preserve it from plainness. A large *Mespilus canadensis* was, when we saw it in the autumn, and when it had acquired all its mellow red and yellow tints, a remarkable good feature on this park slope.

Pain's Hill will occupy at least three or four hours to walk round it even hurriedly. It is, in many parts, far too much encumbered with trees, and would be greatly improved by judicious thinning, and by openings to admit views of the neighbouring country. But, for its specimen trees, its groups in the park, the beauty of its undulated ground, the charming diversity of scene which its lake presents, and for its admirable grotto, it is a place which will bear much examination and study, and may doubtless be inspected again and again with increasing pleasure.

The gardens of *Sigismund Rucker, Esq.*, at Wandsworth, though small, exhibit some interesting features, and contain a very fine collection of exotic plants, especially orchids. Of the latter tribe the plants here are probably unequalled in this country, and they invariably obtain some of the best prizes at the great exhibitions. The collection of heaths, too, is of the highest excellence, though these are gradually being dispersed, as opportunities arise, that more undivided attention may be given to the orchids.

The place is situated on West Hill, and the house lies rather near to the road. There is little view beyond it. A small conservatory is attached to the house, and contains, among the usual floral ornaments, several elegant sculptured figures, China vases, &c. The lawn, which is exceedingly neat, and very tastefully arranged, is decorated with numerous masses of Rhododendrons, Azaleas, Roses, and occasional beds of summer flowers, while there are many specimen plants of the Deodar cedar, *Araucaria*, *Abies Douglasii*, various Pines, some excellent standard Rhododendrons, a beautiful patch of *Juniperus sabina tamariscifolia*, &c. Of the roses, the hybrid perpetual varieties are chiefly grown, and as these come into bloom after the Rhododendrons and Azaleas, and remain flowering till late in the season, the place is kept continually gay.

William Leaf, Esq., has a delightful place at Streatham, in Surrey, which, though originally comprising the poorest elements, has, by the spirited diversion of the road in front of it, and of a public footpath which crossed the middle of what is now the lawn, been made into a thoroughly excellent villa garden. We believe it was laid out by the late Mr. Loudon.

The house is in the Italian style, and a semicircular projection, supported on pillars and surmounted by a dome, is thrown out from the front of the upper stories, while a terrace walk extends along the principal or garden front. Near the end of the terrace is a conservatory, with a curvilinear iron roof, and having the specimens planted out in beds. The Acacias, Polygalas, and some other plants in it are extremely fine.

In the garden and on the lawn there is a number of rare and ornamental shrubs. A high bank has been thrown up, and happily clothed with pines and other trees at the lower part of the garden, to exclude the walls, &c., of a neighbouring estate. In the middle of a small pool of water an island is entirely covered with the common dogwood, which, spreading down its branches to the water, forms an interesting object at all seasons, but especially when its leaves change colour in the autumn, and while the red bark of its shoots is so conspicuous during winter.

The delightful garden of *John Warner, Esq.*, is situated about a mile from the Broxbourne Station on the Eastern Counties Railway, and 17 miles from London. It has been under the superintendence of Mr. Williams for nearly 30 years. On the lawn near the house are some very fine specimens of the fern-leaved beech, weeping elm, deodar cedar, *Daphne pontica*, and many other very ornamental trees and shrubs.

An excellent view of this lawn is obtained from a raised terrace of some length at the upper end; and from this terrace a closely-shaded walk descends in a winding direction to a lake, which is crossed by a rustic bridge. Here the spectator is astonished by an admirable imitation of broken rocks, formed entirely of bricks and cement, which have all the appearance of having been worn by the current of a stream. Almost adjoining these is a rustic building, in full accordance with them. Apart from this is a garden partly devoted to dahlias, and adjoining the lawn on one side of it is a border of roses, consisting of dwarfs and standards, among which are many of the new and leading varieties. In the middle of this garden, and entangled into one mass, is a large column of roses, chiefly the *R. sempervirens*, the effect of which is decidedly good when in bloom.

The Zoological Gardens, in the *Regent's Park*, do not contain much that requires notice in a gardening point of view, but demand a passing glance. They are entered from the road which surrounds the Regent's Park on the north-west side, and lie on both sides of that road, the two parts being appropriately connected by a short tunnel. Being situated within the actual boundary of the Regent's Park, they have the advantage of looking upon its large area of greensward on the south side.

A straight principal walk passes through the garden at an oblique angle from the main entrance, and leads by a flight of steps over the roof of one of the larger menageries, this roof being balustraded at the sides, and forming a large terrace platform, from which much of the garden and the park may be viewed. The sides of the walk leading to this terrace are bordered by lines of standard roses, and a series of small flower-beds, backed by shrubs.

The rest of the garden is laid out in the most irregular manner possible, so as to obtain a great number and variety of walks. Most of the shrubs and plants are healthy and flourishing, and some of them are handsome. On a raised bank at the south side of the garden, where the grass is carried up to the base of the shrubs which clothe its summit, a number of strong-growing herbaceous plants are scattered about in front of the shrubs and among them, and, growing out of the grass, they contribute to break and soften off the outline of the shrubs. In another part, there are one or two pleasing islands, clothed with a thicket of dogwood, privet, &c., in the midst of pools used for water-fowl; and besides being in themselves picturesque, on account of the denseness of their clothing, these islands form an excellent cover for the birds to retire into.

In one part of the garden, where some evergreen shrubs and specimens had been newly planted last winter, these were somewhat unnecessarily protected by having a quantity of straw loosely shaken over them. Some very large specimens of weeping ash have their branches fastened flatly to a trellis which forms a kind of covering to a place in which a number of birds are kept, and though they have a very artificial appearance, they create a good shelter.

Several of the structures appropriated to different animals are picturesque and pleasing examples of the rustic style. The new aviaries, too, appear well arranged and excellent, and when partially clothed with climbers, as seems to be intended, they will be yet more suitable and beautiful. Everything in the way of buildings is, in short, substantial and respectable; and the gardens are kept as neatly and well as the large number of visitors will allow them to be. There is a particular air of cleanliness and comfort about all the houses used for birds and animals. The inclosures for birds, &c., are surrounded mostly by a wire fence, with a row of close wires curved boldly outwards at about two feet from the ground, to prevent any small wild animals or vermin from entering the inclosure.

Passing through the tunnel, that portion of the garden north of the park road is on the slope of a bank, with a canal at the bottom, and constitutes a pleasant and shady summer walk. The new museum, the giraffes, the huge hippopotamus, &c., are in this direction. There are some handsome thorns in a few of the inclosures. We cannot speak of the collection of animals, &c., in this place, though this is undoubtedly very perfect, and all are in the best condition.

NURSERIES, FLORISTS' GARDENS, &c. The characteristic of the London nurseries, and that which mainly distinguishes them from provincial establishments of this sort, is that they abound in indoor exotics. With a few exceptions, such as the great Exeter nurseries, for example, exotic plants that require protection or artificial heat are but sparingly and imperfectly grown in the provinces, as compared with London. And, on the other hand, provincial nurseries are, from having a better atmosphere, and often from a superior method of treatment, the best marts for hardy trees and shrubs. In general, there is far too much use made of the knife in the London nurseries, and ornamental plants are budded or grafted on stocks that are too tall, so that hardy plants obtained from them will often be many years before they become bushy, and some of them will never do so. This is a defect which is, however, in part remedied in some establishments, and which will, we hope, soon be entirely done away with; as nothing can be more objectionable than the pruning up of trees, that are intended for ornament, to bare tall stems.

The nursery of *Messrs. Loddiges*, at *Hackney*, is one of the oldest and most celebrated of the London gardens of its class, although it is now, from the expiration of the lease of part of the ground, and the encroachments of a rapidly-enlarging population, becoming somewhat crippled, and is in process of transformation. The objects for which it has been most famed are its palms, orchids, camellias, and arboretum. The latter was long regarded as the most complete in the country, and contained many rare specimens, the whole of the plants being arranged alphabetically by the sides of an almost labyrinthine series of paths. But the atmosphere having become so deteriorated by smoke, and the ground being wanted for other purposes, this most perfect collection, which has been the foundation of most others of the kind throughout the country, will, we believe, have gradually to be relinquished.

The nursery of *Messrs. Low and Co.*, at *Clapton*, is little more than two miles from Messrs. Loddiges, and may be visited at the same time. Here, from the system adopted of rapidly clearing off the stock, there is seldom any large specimen plants to be seen. But a very large stock of the most popular greenhouse plants is reared and kept in the best order; and, from the enterprise of Mr. Low, great numbers of new plants are sure to be found in his nursery, at almost every season of the year.

The stock of the hardier and more showy heaths, and of those plants which peculiarly suit the London markets, was particularly good when we called here last autumn. Both in the greenhouses and in long ranges of excellent pits, there was an extraordinary quantity of plants of this description, in the most beautiful health and keeping. In the pits a bed of large clinkers is made at the bottom, and small cinders, on which the pots rest, are placed over these.

Messrs. Rollisson's Nursery, at *Tooting*, is about seven miles from London, on the Surrey side, and has been long noted for heath-growing. It has latterly, also, acquired a large collection of orchids, and contains a very good assortment of general greenhouse and stove plants, besides having an excellent stock of ornamental shrubs and trees, especially the American plants. The latter are grown in various plots, apart from the main nursery.

At the end of the large new orchid-house, a very complete collection of Pitcher Plants is kept; and as some of them are quite novel, and all of them are exceedingly interesting, we insert a popular description of the various sorts with which Messrs. Rollisson have obligingly favoured us. The plants are grown at the hottest end of the house, as they are excessively fond of heat and moisture.

Nepenthes distillatoria, the common Pitcher Plant, was first introduced about the year 1789, and is by far the most generally cultivated. It is a native of China and the Indies, and is readily distinguished by its pitchers, which are usually from 8 inches to a foot long, of a pale green when young, afterwards of a reddish brown, especially near the mouth of the pitcher. The lid is of a circular form, and is furnished with a small spur * at the back. The leaves are usually about 18 inches in length and 3 inches wide, and smooth on the edges. Before the pitchers open, they are one-third filled wth a transparent fluid, by which ants, cockroaches, and other insects are attracted and drowned. Independently of the curious character of the plant, it deserves culture as an insect trap.

N. lœvis is the smallest of the genus, as regards both the plant and pitchers. The leaves are 7 or 8 inches in length, and 1¾ inch wide, smooth and glossy, entire on the margin, and tapering to a narrow point. The pitchers are from 2 to 3 inches long, of nearly the same form as *N. distillatoria*, pale green when young, afterwards veined with red. They are furnished with two narrow fimbriated wings. This species may be distinguished at first sight, even without the pitchers, for the leaves, independently of being so narrow and pointed, are deeply channelled. It is from the East Indies.

N. phyllamphora. The leaves of this plant are furnished with small teeth on the margin of each, by which character it may always be distinguished from all others in cultivation. The whole plant is of a much paler green than any of the others. The leaves vary from 1 foot to 18 inches in length, and are from 3 to 4 inches wide. The pitchers are of a pale green, entirely destitute of marks, about 6 inches in length, and similar in form to those of *N. distillatoria*, the stem being smooth. It is a native of the East Indies.

N. Rafflesiana is very robust in habit. The stem is thick, and covered with a buff-coloured mealy substance; the leaves are very strong, being from the stem to the pitcher 3 feet in length, undulated, and 5 inches across at the widest part. The pitchers are very beautiful, and are 10 inches in length, pale green, and richly mottled and spotted inside and out with a glossy reddish brown. The lid is also similarly marked. When young, the plants produce pitchers widest at the *lower part*, and furnished with two fringed wings; but as the plant advances, the tendrils become spiral, and the pitchers are produced without wings and widest at the

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* This spur is common to all the Nepenthes.

upper part. When laden with its richly-coloured pitchers the appearance of the plant is truly noble. It is said to be from Singapore.

N. albo-marginata is of dwarf habit compared with others of the same family. The leaves are 18 inches long, smooth and glossy on the upper surface and rough underneath, and about 1¼ inch wide. It may be distinguished by a beautiful white band round the outside of the mouth of the pitcher. The pitcher is pale green inside, and on the outside it is streaked with red, and 4 inches long. This is also from the East Indies.

N. species, Java. This plant is new to the country, and supposed to be the one described by Dr. Blume under the name of *Nepenthes Gymnamphora.* It was sent from Java by Mr. Henshall, the collector to the Tooting Nursery, about two years since, along with another species mentioned below. The leaves at present on the plant are 7 inches long and 1½ inch wide, tapering, surface smooth, margin minutely serrated. The pitchers are 3½ inches long, contracted on the upper half, of a light green outside, and the inside beautifully spotted with red. The mouth of the pitcher reaches down to one-third of the length of the same, a peculiarity not to be found in any other Nepenthes; and although the pitchers at present on the plant are small, there is no doubt of its being a very beautiful species, for the pitchers gathered in its native locality and dried previous to their being sent home, are of large dimensions, of a purplish hue inside, and may now be seen in the Museum at Kew Gardens.

N. species, Java. Like the preceding in form and size, but the pitchers are entirely destitute of spots or markings of any kind; being pale green inside and out.

N. Hookeriana. In its general aspect this plant resembles *N. Rafflesiana.* The leaves are 21 inches long and 4 inches across, margin entire, and the surface smooth. The pitchers are 4 inches long, of a pale green, spotted and marked with red inside and out, gradually widening upwards, and invariably destitute of wings. The inside is furnished with a rim half an inch wide from the mouth downwards, which is sparingly striped with red. The lid is nearly erect, and, compared with *N. Rafflesiana*, the mouth is more horizontal.

N. ampullacea. The stem and leaves of this plant are hoary, and the pitchers widely different from all others. They are usually about 3 inches in length, and 1¼ inch wide. The mouth of the pitcher is *horizontal*, which is not the case with any other Nepenthes. The operculum, or lid, is not half large enough to cover the mouth of the pitcher, being 1 inch long and only a quarter of an inch wide. In form the pitcher is elliptical, of a green colour in young plants, but when more mature they are spotted with red. The linear lid is alone sufficient to distinguish this species. It is from the East Indies.

N. sanguinea. The pitchers are of a beautiful red, but young plants will produce pitchers with only a few red spots and streaks. The leaves are thickly set on the stem, 16 inches long, and very smooth and glossy. The pitchers are 6 inches in length, a little contracted on the upper half, and furnished with two membranous fimbriated wings. The operculum is ovate. The plant, when sufficiently mature to produce its red pitchers, is strikingly beautiful. It is from Mount Ophir.

N. Rafflesiana—var. This is in all respects, save in the colour of the pitchers, like *Rafflesiana*, but the pitchers are so intensely spotted and mottled, that they look as if the ground colour was red, with a few green spots upon it. As the plant constantly produces pitchers exhibiting this peculiarity, it may be considered a permanent variety.

The beautiful *Cephalotus follicularis*, which is like a miniature pitcher plant, and the singular but more common *Dionœa muscipula*, accompany the pitcher plants already described, and make the collection of this tribe complete.

The *Exotic Nursery, King's Road, Chelsea*, was founded in 1808 by *Mr. Knight*, who, having purchased the land it occupies, has almost annually built upon it fresh plant houses, and raised it to its present acknowledged eminence. In 1845 Mr. Knight associated with him his nephew Mr. Perry, and in their joint names the business is now conducted.

It is very appropriately called the "Exotic Nursery," being particularly rich in plants that require shelter, and not, until very lately, including the culture of the commoner trees, but only of the more ornamental and curious hardy plants. A new and handsome entrance has lately been made at the upper side of the nursery, on the Fulham Road, and by this or by the older one in the King's Road, the place may be approached. The plant houses lie nearer the latter of these entrances, and, in fact, a glazed passage conducts from the door to the old conservatory, where there are some very large plants of *Rhododendron arboreum*, which occasionally flower in great profusion.

Passing through the conservatory, we enter a court surrounded with plant houses, and in this open space the bulk of the greenhouse plants are very tastefully arranged during summer, on a flooring of cinders. The plants are grouped together in masses, according to a fixed and regular plan, with passages between the groups; and much variety is attained by the aid of taller plants, conifers, standards, &c. Some standard bay-trees, with roundish heads, are particularly observable, and are considered a good substitute for orange-trees in Italian gardening. They simply require protection from very severe frost in winter.

On the stages in front of the houses at the north side of the square, several ornamental oblong flat vases are placed, for containing aquatics. The pretty little *Nymphœa pygmœa* is grown in some of them. A small stove, further on, has its roof entirely covered with *Stephanotis floribunda.* This is a low span-roofed house, and has a bark bed in it, besides being heated by hot water. In a lofty orange house, the pretty little Otaheite orange is extensively grown, and is nearly always in bloom. The collection contains a great many Indian and hardy Azaleas, some of which are seedlings. A larger stove, in two compartments, comprises many singular and beautiful variegated plants; and as these are now much sought after, we have obtained from Messrs. Knight and Perry the following list of the stove varieties which they cultivate:—

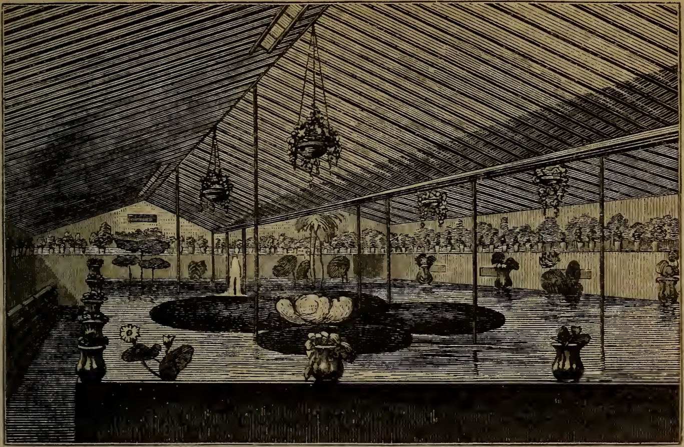
Phrynum zebrina.
Tillardsia zonata.
Dichorizandra discolor nana.
,, variegata.
,, rubra striata.
Duranta Beaumardii.
Maranta zebrina.
,, bicolor.
,, rosea-lineata.
,, alba-lineata.
Tillardsia campanulata.
Tillardsia acaulis zonata.
Croton pictum.
,, angustifolium.
,, latifolium.
Dracœna terminalis.
Echites picta (climber).
Eranthemum leuconerum.
Hoya variegata.
Vriesia speciosa.
Aspidistus variegata.
Jasminum gracilis variegatum (climber).

Many of these plants are extremely beautiful, and all are worthy of being grown, as they tend so very much to enliven a collection in winter.

The propagating-house is very complete in this establishment, and is freely shown to visitors. It has a northern aspect, and is filled with small raised frames the lights of which are hung on hinges at the top. In these frames the cutting pots are plunged in fine coal ashes. A potting and compost shed, and a house for young stock, are all under the same roof.

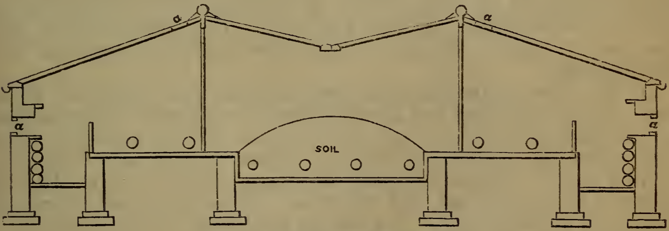
A new Aquarium has recently been built here, partly to accommodate the *Victoria regia*, and partly to show how the now popular tribe of aquatics may be managed. This is the first nursery establishment in which anything of the kind has been attempted; and there is scarcely a private garden at present in which a house so complete, and a collection so comprehensive, exists. We are much indebted to Messrs. Knight and Perry for being able to supply an interior view and section of this Aquarium, as well as to give a description of it, and add a list of the plants grown in it. (See opposite page.)

This building was constructed by Messrs. Gray and Ornson, and is rather more than 37 ft. long by 30 ft. wide. It is composed of two span roofs, supported by iron columns, and incloses a slate tank, 30 ft. long and 22 ft. 9 in. wide, with the centre part intended for soil 3 ft. deep, and the sides 18 in. A commodious path surrounds the tank on two sides and at the entrance end, while the furthest or eastern end of the tank is at the extremity of the house, thereby affording the means of giving up about 5 ft. at the eastern end of the tank to the Nelumbiums, Papyrus, and other tall-growing aquatics. The square of the tank (that is, 22 ft. 9 in. each way) is devoted to the *Victoria regia*, with the exception of the corners, which are occupied by *Nymphœa stellata*, *rubra*, *cœrulea*, and *sanguinea.* The noble *N. dentata* finds a place at the east end, under the *centre* of the house, which, perhaps, is



INTERIOR VIEW OF THE AQUARIUM.

barely high enough for the Nelumbiums. At intervals of 7 ft. along the sides and west end of the tank are placed little vases containing *Nymphœa pygmœa*, and the roof is relieved by pendent vases for orchids or other plants that delight in such a situation. At the west or entrance end of the house is a narrow platform occupied by a succession of oblong tanks for the culture of *Aponogeton juncifolium*, *Pistis stratioles*, and other curious little water plants requiring a high temperature.



SECTION OF THE FORCING HOUSE.

The atmosphere of the house is warmed by four 4-inch pipes, extending the whole length on both sides; and the water by eight 4-inch pipes, four of which traverse the deep, and four the shallow part of the tank. Ventilation is secured by six apertures (*a*, *a*, in the section), covered with sliding slates, in the wall on each side of the house, by twelve ventilators placed in the highest part of the two ridges of the roof, and by two larger ventilators at each end of the house.

It having been judged by competent authority that motion in the water where the *Victoria* grows is a desideratum, it is imparted here, but in a novel way. The supply of water is brought from a distant reservoir, into which it is pumped by manual power, and is not abundant: it has therefore to be economized. It is introduced into the house by a large leaden pipe, which, narrowing itself at the orifice, discharges the water into a copper vessel containing about a quart, so fixed on an axis that when it is full, the increased weight at the lip of the vessel causes it to turn over and cast its contents into the tank, which, being about 20 in. beneath, receives so great an agitation on the surface of the water as to put the whole in movement. The vessel regains its equilibrium by a weight attached to the base, and then receives a fresh supply, to be again discharged when the vessel is full, and so proceeding till the water in the reservoir is exhausted. At some future period this little device may be clothed in a more elegant form.

The slate tank is set on a bed of concrete; and the soil for the *Victoria* is composed chiefly of Wanstead loam, with a little leaf mould, and a good portion of silver-sand.

Altogether, this Aquarium is a very complete and interesting structure; and that our account of it may be in no respect deficient, we insert a list of the water plants which it contains:—

Victoria regia.
Nelumbium album.
,, luteum.
,, speciosum.
,, Count of Thun.
,, caspicum.
Euryala ferox.
Nymphæa dentata.
,, stellata.
,, rubra.
,, cœrulea.
,, pygmæa.
,, odorata.
,, ,, minor.

Nymphæa sanguinea.
Thalia dealbata.
Limnocharis Humboldtii.
,, Plumierii.
Pistis stratioles.
Pontederia crassipes.
,, cordata.
Caladium bicolor.
,, pictum.
,, esculentum.
Ceratopteris thalictroides.
Aponogeton juncifolium.
Papyrus antiquorum.

In the outdoor department this nursery is particularly well furnished with plants of the coniferous tribe. There is a most extensive and complete collection of the better kinds, all grown in pots, and embracing plants of various sizes. Messrs. Knight and Perry have, indeed, published a very useful synopsis of the coniferous plants grown in their establishment.

All the more ornamental American plants are also extensively grown here. The rarer Azaleas and Rhododendrons are especially abundant and good. We observed, also, a very fine specimen of that peculiarly handsome plant, the *Andromeda arborea.* Messrs. Knight and Perry have likewise a new autumn-flowering laburnum, which we saw blooming profusely in October last, and which will be a curious and interesting addition to the shrubbery. The trained fruit-trees are likewise good at this nursery, and are first trained to stakes, in the open quarters, then to a very low wall, and ultimately to a higher wall, to prepare them for sale.

In order to afford the gardeners entering this establishment an opportunity for improving themselves, and to render those who are recommended to places more fit for undertaking their varied duties, what is called the "study" has been most liberally constructed here, and fitted up at great expense, being furnished with appropriate books, drawing instruments, chemical apparatus, &c., to which those who work in the nursery have free access after working hours.

About three years ago Messrs. Knight and Perry greatly enlarged their outdoor space by the purchase of a large piece of land at Battersea, called the Brooklands Nursery, in which they now grow a very excellent collection of the best hardy ornamental trees and shrubs. This branch nursery occupies about twelve acres, and is laid out in square or oblong plots of a given size, so that the contents of every one of these plots is easily ascertained for working purposes. Two borders filled with beautiful specimen trees extend down the centre; and among the plants grown here there will be found many very rare, curious, and handsome low trees, fitted for lawns or gardens. All the better sorts of plants are labelled. Part of this nursery is appropriated to fruit trees, and another part to an American garden; while a place is provided for growing all the more pleasing hardy aquatics. Near the entrance, where a hedge was wanted as a screen, this has been supplied at once by using the black Italian poplar.

Messrs. Henderson's nursery, at Pine Apple Place, Edgware Road, is one which has long been noted for the neat and careful cultivation of heaths and general greenhouse plants, and for supplying all kinds of forced and other plants *in flower* to those who, living in London, have no means of growing them for themselves. It was also formerly a good deal occupied in the rearing of vines; but this part of the business is now, we believe, very little attended to.

The nursery of *Messrs. Lee*, of *Hammersmith*, is one of the oldest in the neighbourhood of London, and the founder of it raised it to great fame and prosperity during the latter part of the last century. From taking thus quite a leading position, it fell, of late years, far behind establishments of even inferior magnitude; at least, so far as indoor plants are concerned. It is now, however, again rallying, and appears to be conducted with more spirit, and to embrace more of the newer and favourite plants.

Messrs. Whitley and Osborn have a nursery at *Fulham*, which is well known as a repository of ornamental shrubs and trees, most of the hardy kinds of these being nicely grown and carefully named; the nomenclature adopted being that of Loudon in his "Arboretum Britannicum." Fruit trees are also well cultivated, and named with equal care.

At *Vauxhall* the nursery of *Messrs. Chandler* is celebrated for its Camellias, of which there is a large quantity, well grown, and of various heights. When in full bloom, during March and April, they create a superb display. They are cultivated both in houses and pits, the development of flowers being hastened or retarded according as the plants are or are not placed out of doors during the summer. When they are kept in the house all the season—as they were last summer—they bloom a fortnight or three weeks sooner, and the leaves assume a much brighter green tint during autumn and winter. The plants are slightly shaded in summer (the houses having a southerly aspect) by the inside of the glass being whitewashed. The stocks are raised for grafting, and the process of grafting is carried on, in pits and frames. A few of the common kinds are planted out in the borders, and against a north wall; but although they have stood uninjured for many years, their flowers are almost annually spoiled by early frosts.

On the same wall as the Camellias are many remarkable plants of the *Magnolia conspicua*, which are exceedingly beautiful when laden with their large white flowers in early spring. A large *Wistaria* in the open ground is treated as a kind of low tree, and makes an interesting and showy object. Rows of climbing roses in the borders are kept cut down to within about 4 ft. of the ground, so as to form bushes; and in this state they are very pleasing where formal plants are required, though not, of course, so elegant or picturesque as when treated more naturally. The hardy shrubs are in a healthy condition here, and well grown.

A span-roofed and other greenhouses near the entrance are used for show plants when in flower, and these are filled, in autumn, with a collection of Chinese Chrysanthemums, of which Messrs. Chandler have a large quantity. These plants are not here cultivated to a great size, as they would require so much space to accomplish that; but there is a great variety of them grown, and all the best known sorts are kept. In one of the greenhouses, too, a nice little collection of the smaller Cactaceous plants is preserved.

Mr. Glendinning's nursery, at *Turnham Green*, has long been in existance as the *Chiswick Nursery,* and it is said that Heaths were cultivated here almost earlier than in any of the metropolitan establishments of this kind. . Since it came into possession of the present proprietor, this nursery has greatly risen in character, and is still constantly improving. New houses have been erected, a wider range of plant-culture has been taken, and a considerable interest is made to attach to it on account of the spirit and enterprise with which new plants are procured, and the successful manner in which they are flowered.

Messrs. Paul and Son, of *Cheshunt*, have the nearest nursery to London that is much celebrated for the culture of the Rose, and their garden is noted for its very select stock of this queen of flowers. It is situated about 14 miles from London, and near the Waltham Cross Station of the Cambridge line of the Eastern Counties' Railway, being near the middle of the High Street of Cheshunt.

The nursery covers an area of about 40 acres, of which six acres are devoted to roses. The soil is a light, sandy, and poor loam, and the aspect south-west. A considerable portion of the six acres is used for standards, from three to five feet in height, and what are called dwarf standards. The stocks for budding are planted in the winter and spring months in beds, the rows in these being two feet apart, and the plants nine inches from each other in the rows, the tallest plants being kept in the centre or at the back of the beds. At the time of budding, which takes place the following summer, the greatest care is exercised in keeping the different sections separate, and the plants remain in the beds until the autumn of the ensuing year.

The nursery of *Mr. H. Waterer*, at *Knapp Hill*, is situated in a low, flat district, with a soil which, in many parts, consists of pure heath-mould to the depth of 10 or 12 ft. It is therefore peculiarly suitable for Rhododendrons and the kindred genera, which flourish upon it with a facility and luxuriance that is most wonderful, as compared with the state in which they are ordinarily seen. Rhododendrons, in great variety, all the best Azaleas (including many seedlings), Kalmias, Ledums, and a multitude of pretty dwarf evergreens which are comparatively little known, are here grown in large quantities, and attain a great size; so that, during the time of flowering (which is about the beginning of June), this nursery presents one of the most gorgeous spectacles which it is possible to conceive.

Messrs. Standish and Noble have a nursery near *Bagshot*, which is rich both in American plants and Conifers, and lies at the distance of 6 miles from the Farnborough Station of the South Western Railway, and 4 miles from the Blackwater Station of the Reading and Reigate Railway. This nursery occupies 25 acres of land, of which glass forms no feature, the principal aim being to grow every kind of ornamental tree and shrub, especially evergreens. Each new arrival is subjected to the ordeal of an ordinary winter; when, if it is found wanting in hardiness of constitution, it is discarded as a hardy ornamental plant.

Mr. Smith has a nursery at *Norbiton*, in Surrey, which has long been favourably known for the seedling Azaleas sent out from it, but has of late years come more into note in consequence of the numerous yellow Rhododendrons which have here been raised. The colour of these Rhododendrons, which varies very considerably, is of course obtained from the yellow Chinese Azalea being employed as one of the parents; but although Mr. Smith has been very successful in combining the size and form of the flowers, and the mode of flowering in Rhododendrons with some of the colour of the yellow Azalea, he has not yet been able entirely to secure the excellent habit and foliage of the Rhododendron in any of the new varieties. Hence, the latter have, for the most part, a poor and straggling habit, and are only interesting when they are in flower. While the blossoms are expanded, however, some of the new kinds are particularly striking.

At *Lea Bridge*, near Leytonstone, there is a very rising nursery conducted by *Messrs. Frazer*, who generally succeed in carrying off some of the highest prizes at the great metropolitan exhibitions. The grounds are extensive, and well filled with the best hardy shrubs; while the houses and pits, which are numerous, are furnished with the most popular plants of the day. This nursery is particularly worthy of note for bringing forward specimen plants for the exhibitions. These large houses are now (in the spring of 1851) well stocked with fine large bushes of Azaleas, Epacrises, Ericas, and all those handsome greenhouse species which form the foundation of the large shows at Chiswick and Regent's Park.

The environs of London abound in minor nurseries, particularly about Brompton, Chelsea, &c., some of which are good of their class; but they are so exceedingly numerous that it is impossible to notice them satisfactorily; and we can only pretend to describe the few which, from their size, or the peculiarity of their contents, appear to be the most prominent.

The garden of *Mr. Groom*, at *Clapham Rise*, is more peculiarly a florist's establishment, and is very rich in all kinds of bulbous plants. Mr. Groom has, especially, long been celebrated as a tulip grower; and, about the second week in May, the tulips are a great attraction. The bed under canvas is 120 ft. long, and contains 2000 bulbs. The general collection of tulips comprises about 250,000.

Mr. Cattleugh's garden, at *Chelsea*, has been generally considered a first-rate place for florists' flowers. Pelargoniums, Calceolarias, and Cinerarias constitute the chief features of this class; and there are some large greenhouses in which they are grown. But from part of the nursery being required for building purposes, and from Mr. Cattleugh appearing to give more of his attention to general greenhouse and stove plants and fruit, the florists' flowers do not seem to be so much regarded, and the whole nursery looks out of order. We only saw, as worthy of remark, a good stock of strawberry plants prepared for forcing, and a large quantity of the pretty *Weigela rosea.* Some plants of *Stephanotis floribunda*, *Aphelandra cristata*, and other stove species, were well grown and in good condition.

Mr. Beck's, of *Isleworth*, is a small well-kept place, remarkable for the large numbers of seedling Pelargoniums that are raised in it every year, and from among which some of the best and most fashionable varieties now in cultivation have been selected. It also contains a small but excellent selection of orchids. These are grown in the very best manner, under the management of Mr. Dobson, and some of the plants are large. *Dendrobium nobile* obtained the first prize as a specimen at the London Horticultural Society's exhibition last year.

Of *Market Gardens*, in which extensive forcing is carried on, that of the late *Mr. Wilmot*, at *Isleworth*, is one of the most extraordinary. The number of houses filled with Vines and Pines is truly marvellous. Pines are here cut every day in the year. They are almost entirely Queens, and are grown in houses which all greatly resemble each other, being slightly sunk in the ground, narrow, low, with that part of the roof which is over the path at the back sloping towards the back wall, and quite opaque, being formed of wood coated with tar. They are heated by hot water, and have a pit in them which is filled with fermenting bark, in which the pots are plunged. All the pines are grown in pots.

The vineries are very similar in shape to the pine houses, and the vines were planted without any preparation of soil for them. Those for the later crops are placed outside the houses. Grapes are cut here all the year round, the Black Hamburgh constituting the staple of cultivation, and West's St. Peter's being grown for the later crops. Within the last year or two several houses have been planted with young vines of the Pope and Mill Hill grapes, from which Mr. Wilmot had great expectations. Two crops of grapes are obtained out of some of the houses. Only the vines used for later crops appear to have been at all attacked by mildew.

This garden contains about 100 acres of land; and Mr. Wilmot was accustomed to say that he grew everything upon it, from a potato to a pine-apple. Of a very excellent French bean, called Wilmot's Early Forcing Bean, he grew an immense quantity.

The garden of *Messrs. Chapman*, at *Vauxhall*, is rather celebrated for grape-growing, which is conducted in a great number of houses, and with signal success. There are other good forcing gardens at Vauxhall, in the neighbourhood of this.

Our object and space do not permit us to say more of the market gardening around London, or to describe that branch of it which is carried on in the open air. We will only remark that it has, in the districts near Fulham, Battersea, Hammersmith, Deptford, and more remote parts, attained a perfection which renders it a beautiful as well as interesting sight to examine the regularity and richness of the crops, the rapid system of clearing and fresh-cropping, and the mode of preparing and packing the produce for market. Perhaps in no one department is English gardening arrived at more excellence, or managed with more method and skill, than is to be witnessed in the market gardens which supply the metropolis.

HALLS.

UNDER this appellation places so called in which meetings are held of the several Guilds or City Trade Companies, referred to in article "Corporation of the City of London;" also other large meeting rooms for the several purposes of business, of discussion, and instruction. Several of the Halls are treated of in other places.

Apothecaries' Hall, Water Lane, Blackfriars, established in 1617 as the Hall of the Incorporated Company of Apothecaries. Incorporated as a distinct company from the Grocers, with whom formerly they were connected by James I. In the hall is a portrait of the king, and a statue of Gideon Delaune, apothecary to James I.

Armourers and Braziers' Hall, Coleman Street, incorporated by Henry VI. In the hall is the fine picture of Richard II.'s entry into London, painted by Northcote.

Bakers' Hall, Harp Lane, Great Tower Street. The Bakers of London were formerly divided into two classes, white bakers and brown bakers.

Barber Surgeons' Hall, Monkwell Street, City, built by Inigo Jones, and repaired by the Earl of Burlington. In this hall there is a very fine picture of Henry VIII., painted by Holbein, and some valuable plate.

Brewers' Hall, Addle Street, Wood Street, Cheapside, incorporated by Henry VI.

Carpenters' Hall, London Wall, contains some fine paintings and rich plate.

Clothworkers' Hall, Mincing Lane, Fenchurch Street, incorporated by James I.

Coachmakers' Hall, Noble Street, Foster Lane.

Coopers' Hall, Basinghall Street, incorporated in 1501.

Cordwainers' Hall, Great Distaff Lane, incorporated by Henry IV., in 1410.

Crosby Hall, Bishopsgate Street, founded originally by Sir John Crosby, in 1466. It has recently been restored with a fine open roof, in the domestic perpendicular style. Is at present used for meetings, concerts, and also in it a literary institution hold their meetings.

Cutlers' Hall, Cloak Lane, College Hill, established in the reign of Henry IV.

Commerce (Hall of), Threadneedle Street, erected by Mr. Moxhay, at a cost of 60,000*l.*, for the convenience of merchants.

Commercial Hall, Mincing Lane, an elegant building for the sale of colonial produce, and as an exchange market.

Drapers' Hall, Throgmorton Street, incorporated in 1439, on the attainder of Cromwell, Earl of Essex, whose house and garden ground was acquired by purchase of Henry VIII. Cromwell's house was destroyed in the great fire of 1666; and the new hall built in 1667, from the designs of Jarman, architect of the second Royal Exchange.

Drapers' Gardens are celebrated, and are treated of in another part of this work.

Egyptian Hall, Piccadilly, a public building, the rooms of which are appropriated for exhibitions. It is in the Egyptian style of construction, by Mr. Robinson, architect.

Egyptian Hall, Mansion House, the municipal residence of the Lord Mayor of London. It is a spacious and elegant room, used principally for the city entertainments and banquets, also for public meetings connected with city and national affairs. In this hall the most noble and illustrious men have been entertained, as well as having met and discussed questions for the advancement of civilization, and for the commerce and prosperity of the world. It is 90 feet in length by 59 in width, and is supported by Corinthian columns.

Embroiderers' Hall, Gutter Lane, Cheapside, incorporated by Queen Elizabeth in the fourth year of her reign.

Exeter Hall, Strand, is a proprietary building, and much known by the importance of the meetings usually held in the hall, which is 131 feet in length, 76 feet wide, and 45 feet in height, will contain upwards of 3000 persons sitting with ease. Oratorios and concerts are performed here. The performances in sacred music are unequalled. Various religious societies hold their annual meetings in this hall, and it is much frequented and highly appreciated for its architecture, for its conveniences, and for its acoustics. There are several offices and chambers in the same building.

Fishmongers' Hall, London Bridge, chartered 37th Edward III. The present building, 1831, is by Mr. Henry Roberts, architect. The previous building was by Jarman, the city surveyor, built after the great fire of 1666. The banqueting-room of the present building is in length 73 feet, width 38 feet, height 33 feet.

Freemasons' Hall, in the Freemasons' Tavern, Great Queen Street, Lincoln's Inn Fields, is a most capacious chamber, in which the principal Freemasons' lodges are held. The great hall is an elegant and finely-proportioned room; and, both in architectural character and decoration, is strictly appropriate to the purposes for which it was designed; its length is 92 feet, its breadth 43 feet, and its height 60 feet.

Girdlers' Hall, Basinghall Street, incorporated in 1449.

Greenwich Hospital, Painted Hall, a splendid interior, painted and decorated by Sir James Thornhill, 1707; in this hall is a fine gallery of pictures of naval subjects.

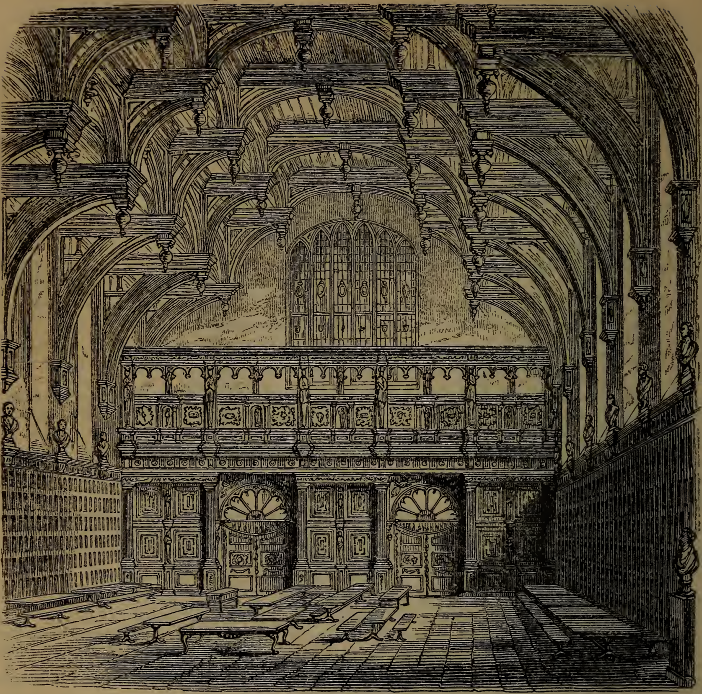
Goldsmiths' Hall, Foster Lane, General Post Office, incorporated in 1357. The present building is a very magnificent edifice, by Mr. P. Hardwick, architect; opened in 1835. The hall and apartments are splendidly decorated and furnished.

Grocers' Hall, in the Poultry, Cheapside, incorporated in 1345. The first hall was built in 1427; the present one opened in 1802.

Guildhall, of the city of London, the Great Hall, the fountain seat of the magistracy, the guilds, the courts, the common hall; first erected in 1411, subsequently rebuilt and adorned. The hall is most capacious for public assemblies, 153 feet in length, 48 feet in width, 55 feet in height; and is the site on which has been contended many a corporate and political strife.

Haberdashers' Hall, Staining Lane, Cheapside. The hall was destroyed in the great fire, but rebuilt by Sir C. Wren; incorporated 26th of Henry VI.

Halls of Inns of Court, see article, "Inns of Court."



MIDDLE TEMPLE HALL.

Hampton Court Hall, built in the time of Henry VIII., is a magnificent structure, and much adorned, is 108 feet long, 40 feet wide, and 45 feet high.

Hicks's Hall, the Sessions house of the county of Middlesex, in St. John's Street, Clerkenwell.

Innholders' Hall, College Street, Dowgate.

Ironmongers' Hall, Fenchurch Street. The present one was erected by Mr. Holden, architect, in 1748; incorporated in 1464.

Joiners' Hall, Upper Thames Street, incorporated 1570.

Lambeth Palace Hall, residence of the Archbishop of Canterbury, built 1244. The hall is a fine interior, and now is appropriated for the library. (See also page 174.)

Leathersellers' Hall, St. Helen's Place, incorporated 21st of Richard II.

Mercers' Hall, Cheapside, the first of the twelve great companies of the city.

Merchant Tailors' Hall, in Threadneedle Street, incorporated 1466. The wall was rebuilt after the great fire by Jarman, the city architect, and is the largest of the city halls.

Middle Temple Hall was erected in 1572, while Plowden was the treasurer. It is a splendid interior, of the Renaissance and Elizabethan style, as seen above.

Music Hall (St. Martin's), Hullah's, Long Acre, recently erected by Mr. R. Westmacott.

Painterstainers' Hall, Little Trinity Lane. This company gave the first idea of the Royal Academy; its existence as a guild was known prior to 1580.

Pewterers' Hall. Lime Street, incorporated 1474.

Pinners' Hall, Old Broad Street, a great place for dissenting preaching in the time of Charles II.

Plasterers' Hall, Addle Street, Wood Street.

Plumbers' Hall, Great Bush Lane, Cannon Street, incorported by James I.

Royal Music Hall, Adelaide Street, Strand.

Saddlers' Hall, Cheapside, one of the most ancient of the minor companies.

Salters' Hall, Oxford Court, St. Swithin's Lane.

Skinners' Hall, Dowgate Hill.

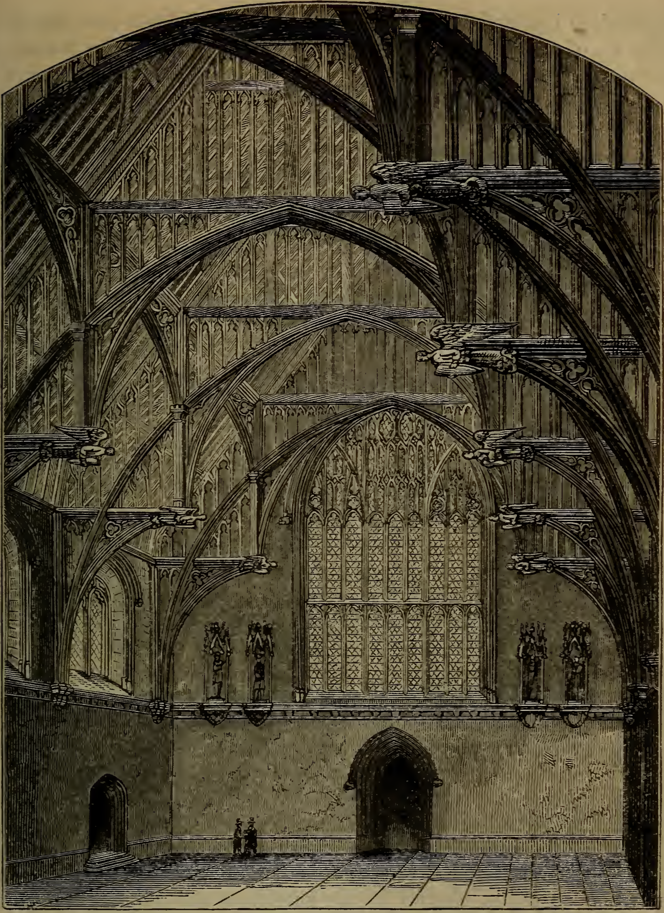
South Sea House, Threadneedle Street. The hall is appropriated for the place of business of the merchants trading to South America, and the South Sea generally.

Stationers' Hall, Stationers' Court, Ludgate Hill, incorporated in 1557.

Tallow Chandlers' Hall, Dowgate Hill, incorporated by Edward IV.

Vintners' Hall, Upper Thames Street, a very ancient company.

Watermen's Hall, St. Mary at Hill, Lower Thames Street, made by Philip and Mary.



WESTMINSTER HALL.

Weavers' Hall, Basinghall Street, incorporated in 1184.

Wax Chandlers' Hall, Maiden Lane, Wood Street, Cheapside, incorporated in 1484.

Westminster Hall is the most ancient and splendid of halls, and is the palace most closely associated with the history of the country; see the illustration above; for a further description, see "Architecture."

Whitehall, see also article "Architecture."

HOSPITALS.

UNDER the general head of HOSPITALS, &c., it is found convenient to include all public institutions for the relief of sickness and disease, whether such institutions are wholly dependent upon the payment of those benefited, of which, however, there is no other instance than the

Sanatorium initiated by Mr. Dickens, but now defunct; or only partially so, of which there are several instances; whether the gratuitous assistance given arise from royal endowment, as at St. Bartholomew's, St. Thomas's, Bethlehem, and others; from the munificence of individuals, as at Guy's; or from the voluntary gifts or annual contributions of the public, as is the case with the greater number. So, also, although the word *hospital*, in the restricted sense in which it is more commonly used, denotes only such institutions as receive patients within their walls; yet in this chapter are included those which merely afford relief to patients at their own homes or attending at the institution, those where advice only is given, and those which also supply medicines, instruments, &c.; as well too those in which curable diseases only are treated, as those where arrangements are made for assuaging incurable disorders; in fact, *public* establishments of all kinds, whether general, special, gratuitous, or the reverse, which offer medical or surgical relief. It will, however, be convenient to divide them into four classes:—

As 1. General Hospitals. 2. Special Hospitals. 3. General Dispensaries. 4. Miscellaneous: including dispensaries, infirmaries, medical asylums, maternity charities, &c.

The GENERAL HOSPITALS are public institutions for administering medical and surgical relief to patients within the building (in-patients), or attending at specified times (out-patients), and suffering under any illness or disease, except such as are incurable or contagious: for which latter infirmaries or special hospitals are the proper places. They are twelve in number; their names follow in the order of their localities: St. Mary-le-bone, St. George's, Westminster, Charing Cross, Middlesex, King's College, University College, Royal Free, London, St. Bartholomew's, Guy's, St. Thomas's.

It may be said generally of these hospitals that their incomes depend more or less (except in the case of Guy's) upon voluntary contributions; that they are each of them, in most instances, under the management of a board of governors, whose qualification is a donation or yearly subscription of a certain amount; that the medical treatment is administered by a certain number of non-resident physicians and surgeons, elected by the governors and unpaid; by one or more resident house-surgeons, also unpaid, and who are generally young men, not long out of their pupilage, and not in private practice; and one or more resident and paid apothecaries. Each physician and surgeon has his own peculiar patients and days of attendance, the resident medical officers taking charge of them under his supervision.

The patients are admitted through the recommendation of a governor on stated days only, except in cases of emergency; the Royal Free Hospital affording, however, an exception to this general rule, as sickness alone, without any recommendation, is considered to give a claim to admission.

There is attached to each hospital a school for the instruction of medical students, either within the walls of the institution or in some neighbouring building, where the chief lecturers and instructors are generally the medical officers of the hospital, who are, in most cases, permitted by the governors also to take hospital pupils, the fees paid by whom are the only emolument which these officers receive. Of these general hospitals seven were in existence before the commencement of this century, containing 2000 beds; during this century five others have been founded, and the beds now in all twelve amount to 3326. There is room, however, for upwards of 4000 beds. Their united incomes are 111,000*l.* from property; 32,000*l.* from contributions. In the year 1849 there were 330,000 patients; of whom 33,260 were in-patients; 296,740 out-patients.

The SPECIAL HOSPITALS are some of them restricted to particular classes of persons:—such are the Seamen's Hospital Society; the Spanish and Portuguese Jews' Hospital; the German Hospital. Others are confined to a particular class of diseases or ailments:—such are the London Fever Hospital; the Consumptive Hospital; the Hospital for Diseases peculiar to Women; Hospital for Children; the Small-Pox Hospital; the Royal London Ophthalmic; Royal Eye Infirmary; Royal Westminster Ophthalmic; North London Ophthalmic; Central London Ophthalmic; the Orthopodic; the Verral and Harrison's Hospitals for spinal and other deformities; the Fistula Infirmary; the Lock Hospital for venereal disease; Bethlehem, St. Luke's, and Hanwell, Lunatic Asylums; the Hospital for Idiots; the Female Invalid Asylum; the Home for Female Invalids; the Metropolitan Convalescent Institution; four Lying-in Hospitals; to which may be added, the Sea Bathing Infirmary. These make what may be called 30 Special Hospitals, having altogether 2900 beds. Twenty-one of them were founded during this century. In the year 1800 they furnished 1230 beds. They receive annually about 9100 in-patients.

DISPENSARIES are by no means the least useful institutions for the relief of the suffering poor. There are in London and its immediate vicinity about 35 that may be classed under the title of General Dispensaries, their purpose being to relieve the sick, infirm, and lying-in at their own houses or at the institutions. Some of these are "provident" institutions; that is to say, the relief is not wholly charitable, but a small weekly or periodical subscription is necessary to entitle a person to the benefits of attendance during sickness.

There is a dislike among the metropolitan poor, and indeed the English poor generally, to entering a hospital, so that these dispensaries are of very great benefit, particularly the provident institutions, as they have none of the humiliating effects which charitable relief produces on some minds, while they encourage the domestic feelings, and promote habits of economy and prudence. They are pretty fairly distributed throughout the metropolis; 4 being in the north, 3 in the south, 12 in the east, 8 in the west, and 8 central. This arrangement, according to their localities, is that adopted by Mr. Low, from whose very valuable book, "The Charities of London," has been derived the very greatest assistance in the compilation of this chapter on Hospitals, and particularly as regards the dispensaries and minor medical charities. Of these general dispensaries 13 existed in the year 1800. In the year 1849 they relieved 141,000 patients. Their incomes amount to 14,424*l.*; from contributions, 11,470*l.*; from property, 2954*l.*

The MISCELLANEOUS MEDICAL INSTITUTIONS, which are not included in the above classes, are some 21 in number. They are establishments of various kinds, and under various names, as asylums, infirmaries, dispensaries, &c., which do not receive in-patients: such are institutions for delivering women at their own homes, Truss Societies, Asthma Infirmaries, Vaccine Institutions, Institutions for diseases of the Skin and Ear, &c. Of these four existed before the year 1800. In the year 1849, 67,000 patients partook of their benefits.

Institutions which are merely sanitary, that is, for *preserving* health, or merely humane, and only distantly relieving ill-health; all mere asylums, and houses of nightly shelter, have been excluded in the above enumeration. This part of the work is strictly confined to a description of what may be called *sanatory* or disease-curing institutions, in contradistinction to "sanitary," or preserving-health establishments. Of these sanatory institutions there are about 100, all of which, having been now classified and noticed above, will be described individually, more or less in detail, in the following pages, and for convenience they are not arranged in classes, but alphabetically. It will be advisable, however, to premise a few observations upon the general state of public medical relief in London. This is of course a very different subject from that of public hygiene, which has been treated of elsewhere. The first remark which would be made by a foreigner would probably be one expressive of surprise at the very few public hospitals which depend upon government support; whereas, this is far from being the case in most continental cities. In Paris, for instance, all places of public amusement are taxed for the support of hospitals to a tenth part of their receipts, and there is a tax also on cemeteries for the same purpose. Perhaps, in the next place, he would be struck by the very large number which are supported by private benevolence; but he would soon recollect that his remark would equally apply to almost all our other great institutions, whether for purposes of education, amusement, police, roads, &c. The greater number of these, though not, as in the case of hospitals, depending upon *voluntary* aid, are yet generally independent of assistance from the state, in other words, they are paid for out of the self-imposed taxation of the parish, borough, or county, and not from the Consolidated Fund of the general property of the country. Hospitals, however, are certainly removed from government aid to a still greater degree than any of the above-named institutions, and are equally unmodified by government control. There is in London no *Bureau Central d'Admission* to point out into which hospital the patient shall go; no *general administration*, with an *administrative committee*, and a *consulting committee of advocates* to regulate the affairs of the hospitals and asylums, as at Paris. Everything seems to go unregulated and at hap-hazard; but whatever good effect this central authoritative control may be productive of in other countries, it is very doubtful whether, with our habits, it would be otherwise than prejudicial here. It would introduce, no doubt, a more uniform and systematic method of treatment, would add valuable statistical information more readily, and would, perhaps, discover wants, and point out the way to supply them more quickly. But it would take away a great part of that incentive to popular and extended interest being felt in them, which the management and supervision of the outlay of our own property always generates; and which, as being part of a system opposed to that of centralisation, and one which seeks to be as free as possible from legislative restraint, is at least well fitted to the genius and habits of this country.

The next thing which would strike the foreigner would probably be the small extent of hospital accommodation; and, indeed, of sanatory institutions generally in proportion to the enormous population of this metropolis; and particularly he would notice the almost entire absence of *Maisons de Santé*, that is, hospitals into which patients of the better classes are received at certain rates of payment. Paris, with less than half the population, has one-third more hospital beds than London. This fact, however, results rather from the domestic character of the Englishman than from any other cause. As for recreation and during health he prefers home, so, during sickness, he has a dislike to any other place; among the very poor also it must be confessed that there is a great prejudice against hospitals, as they have a suspicion that they are enticed there as much for the purpose of experiment as from motives of humanity. Mixed with prejudice, however, as this feeling against going, during illness, into a public institution may be, it is undoubtedly, on the whole, a sound one, and is among us so closely connected with the feeling of independence of charity and domestic habits, that it is, perhaps, not to be desired that the proportion of deaths in hospitals to the whole number of deaths should increase. In Paris this proportion is 30 per cent., in London only 5. It is also to be observed that the provincial hospitals in France are not so numerous when compared to those of Paris, as are the country hospitals here when compared with those of London. Without, perhaps, going so far as Montesquieu, there is yet a great deal of truth in his saying in the *Esprit des Lois*, "Malheur, malheur, au pays qui a beaucoup d'hôpitaux;" and he considers that Henry VIII. by destroying the abbeys, hospitals, and houses of refuge, laid the foundation of the future prosperity of this country, by calling forth the resources and energies of the poorer classes, who were no longer able to find the ready charity they had been accustomed to.

The sanatory statistics of hospitals for the year 1849 are the following:—The total number of in-patients treated in all the hospitals was 42,360. The out-patients amounted to 535,000.

The financial condition is as follows:—The united incomes of all these institutions amounted to 264,000*l.*; of this, 184,000*l.* arose from the interest of property; 80,000*l.* from voluntary contributions.

In respect to the progress of hospitals during this century, it has been seen that in the year 1800 there were 33 public sanatory institutions of all kinds; there are now upwards of 100. They furnished in that year 3230 beds; they have now 6226. The population of London was 900,000; it is now more than 2,000,000. So that in proportion to the population the number of beds has remained stationary, while the number of institutions receiving out-patients only has increased in a far greater proportion.

The following alphabetical list of hospitals described in detail is arranged according to the most distinctive word in the general title of each institution. The SPECIAL INSTITUTIONS under the word expressive of the special disease or class of persons for which they are intended; and the GENERAL DISPENSARIES under the word Dispensary in alphabetical order.

Bartholomew's (*St.*) *Hospital*, Smithfield.—The oldest hospital in London. Founded by Rahere, minstrel to Henry I., and first prior of St. Bartholomew, with which priory it was connected in 1113, 1123, or 1133. (See also pp. 131–135.) Repaired 1423, by the executors of the celebrated Richard Whittington. Passed, on the suppression of monasteries, 1537, to Henry VIII., who, on the petition of Sir Richard Gresham, refounded it in 1547 by royal charter. It has been enlarged and partly rebuilt at various times; the Smithfield gate was built, 1702; the great quadrangle by Gibbs, 1730; the anatomical theatre in 1822 and 1835; the surgery in 1842. It contains a portrait of Henry VIII.; one of Dr. Radcliffe, by Kneller: one of Perceval Pott, by Reynolds; and one of Abernethy, by Lawrence. The staircase is painted by Hogarth. All diseases are treated, and there is a large surgery, &c., with operating theatre, open at all hours. A Samaritan fund for relieving poor deserving patients with food, clothes, and money, on quitting the hospital, was founded in 1845; the funds for its support are distinct from the revenues of the hospital, and depend solely on voluntary contributions.

The government is vested in the Lord Mayor and Aldermen, 12 Common Councilmen appointed by their own body, and such other persons as should be chosen at the general courts. The present number of governors is 339, and the qualification a gift of 100*l.* The greatest benefactor was the celebrated Dr. Radcliffe, who left

600*l.* a year. The Samaritan fund is administered by a special committee of governors.

A medical school is attached, in which lectures on all branches of medicine and surgery are given; and there are valuable museums, libraries, reading rooms, &c. In 1843 a collegiate establishment was founded for affording medical instruction with general and moral superintendence and residence within the building. Four scholarships, each tenable for three years, and of the annual value of 45*l.* or 50*l.*, are obtainable.

The medical school is said to have been in existence, and gradually increasing in importance, ever since 1662. The eminent names connected with it are those of the celebrated Harvey, who was physician from 1609 to 1643, Perceval Pott, Dr. W. Pitcairn, Dr. David Pitcairn; and Abernethy, all medical officers and lecturers.

Patients are admitted on Thursdays at eleven; cases of urgency at any time. There are 580 beds. In 1848 there were 5826 in-patients; 19,149 out-patients; and 46,598 casualty: in all 71,573.

The income is about 32,000*l.*; 500*l.* of which is from voluntary contributions.

The medical officers are—Dr. C. Hue, Dr. G. L. Roupell, Dr. G. Burrows, Dr. F. Farre, Dr. H. Jeaffreson, Dr. Patrick Black; W. Lawrence, Esq.; E. Stanley, Esq.; E. A. Lloyd, Esq.; F. C. Skey, Esq.; T. Wormald, Esq.; J. Paget, Esq.

Bethlehem Hospital, Lambeth, is described elsewhere. It must, however, be included among the Special Hospitals, being dedicated to the reception and treatment of the insane. It was founded in 1546. The present building was opened in 1815. The number of beds in 1800 was 270. In 1849 the number of beds was 450; the patients admitted amounted to 330 the average yearly number being 400.

The income is 16,000*l.*

Medical officers—Dr. Monro, Sir A. Morrison, and W. Lawrence, Esq. Clerk, B. Welton, Esq. (*See* " Lunatic Asylums.")

Charing-Cross Hospital, King William Street, West Strand. One of the 12 General Hospitals. Founded in 1818. Present building erected 1831. By this institution not only are patients treated both as out-patients and in-patients, but such as require it are attended at their own homes, particularly midwifery cases, and children suffering under contagious disorders. The governors are donors of 40 guineas; the life-supporters of 20 guineas; an annual subscriber of 2 guineas may recommend an in-patient, an annual subscriber of 1 guinea, or a donor of 10 guineas, may recommend 3 out-patients.

In-patients with letters admitted on Mondays at 12; accidents at all times immediately.

There are 118 beds. During 1849, 18,500 patients were treated, 1200 being in-patients.

The annual revenue is about 2500*l.*, almost entirely from voluntary contributions.

The chief medical officers are—Dr. Shearman, Dr. Golding, Dr. Chowne; H. Hancock, Esq.; J. Avery, Esq.; M. A. Canton. Hon. Secretary, J. Robertson, Esq.

Chest, City of London Hospital for Diseases of the, 6, Liverpool Street, Finsbury. Established 1848. A special dispensary, open daily. Patients during 1849, 900; Income from contributions, 1000*l.* Hon. Sec., D. H. Stone, Esq.

Chest, Dispensary for Consumption, and Diseases of the, 26, Margaret Street, Regent Street. Established 1847. During 1849 upwards of 5000 patients were relieved. Hon. Sec., W. T. Hudson, Esq., 61, South Audley Street.

Children, Royal Infirmary for, Waterloo Bridge Road. Instituted 1816. It is intended for affording prompt relief, without recommendation, to children under 14 years, and also to their sick mothers. In 1849, the number of patients was about 5000. Secretary, E. Meymott, Esq. 34, Stamford Street.

Children, Tower Hamlets and General Dispensary for, 50, Worship Street. Established 1845. During 1849 there were 325 patients. Secretary, J. Watson, Esq.

Consumptive Hospital, Brompton, instituted 1841; incorporated 1849. A hospital especially devoted to consumption and diseases of the chest. It was formerly in Chelsea; but, in 1846, the patients were removed to the present new and handsome building, much to the advantage of their health. The Rose charity fund is a Samaritan fund, similar to that at St. Bartholomew's. A donation of 30 guineas, or a yearly subscription of 1 guinea, constitutes a governor. Among the chief benefactors of this valuable institution is Mademoiselle Lind. Persons, with recommendation as in-patients, may attend daily at 2 o'clock; out-patients daily at 1 o'clock.

There were 282 in-patients during 1849, and 2800 out-patients. Income from contributions, 4000*l.*; from property, *nil*; expenditure, 4400*l.*

Medical Officers — Drs. J. Forbes, C. J. B. Williams, W. H. Walshe, G. H. Roe, T. Thompson, G. Cursham, R. P. Cotton, R. Quain, John Hutchinson, M.D. Secretary, O. P. Cross, Esq.

Convalescents, Metropolitan Institution for. Office, 32, Sackville Street. Established 1843. The hospital, especially devoted to convalescents, is at Carshalton, Surrey. A donation of 10*l.* 10*s.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. Patients admitted upon the recommendation of a governor, and in some cases by the payment in addition of 12*s.* per week, every Friday, at 4 o'clock. During 1849, there were admitted 568 patients. Medical officers—Drs. McIntyre and Bell; W. S. Lucas, Esq.; J. T. Warre, Esq.; E. Wallace, Esq. Secretary, J. Johnston, Esq.

Dispensary (*Blenheim Street Free*), 1, Blenheim Street. Established 1834. No recommendation is necessary. During 1849, number of patients, 5000. Hon. Sec., N. Bennett, Esq., 7, Furnival's Inn.

Dispensary (*Bloomsbury*), 62, Great Russell Street. Instituted 1801. Patients during 1849, 3408. Income, 700*l.*; from property, 360*l.*; from subscriptions, 340*l.*; expenditure, 700*l.* Secretary, G. Stone, Esq.

Dispensary (*Chelsea, Brompton, and Belgrave*), 41, Sloane Square. Established 1812. Patients during 1849, about 4000. Income, 350*l.*; from property, 30*l.*; from subscriptions, 320*l.* Secretary, C. Wilson, Esq.

Dispensary (*Camden Town*), 8, Pratt Street. Established 1848.

Dispensary (*City of London and East London*), 13, Wilson Street, Finsbury Square. Founded 1849. It has a benevolent fund attached. Secretary, G. Smith, Esq.

Dispensary (*City*), 76, Queen Street, Cheapside. Instituted 1789. Patients during 1849, 9826. Secretary, C. F. Robinson, Esq., 7, Queen Street Place.

Dispensary (*Eastern*), Great Alie Street, Goodman's Fields. Instituted 1782. There is a Samaritan fund. Patients during 1849, 3005. Income from property, 240*l.*; from subscriptions, 240*l.* Secretary, G. H. Simmonds, Esq., 7, Great Alie Street.

Dispensary (*Farringdon*), 17, Bartlett's Buildings, Holborn. Established 1828. Lying-in patients also attended. Patients during 1849, 4000. Income during 1849, 300*l.*; from property, 80*l.*; from subscriptions, 220*l.* Hon. Sec., J. Glasworthy, Esq., 2, Charlotte Row, Mansion House.

Dispensary (*Finsbury*), 16, Woodbridge Street, Clerkenwell. Established 1780. Secretary, R. Saywell, Esq.

Dispensary (*Holloway and North Islington*), Francis Place, Holloway. Established 1840. They have three separate dispensing establishments in the district. There is a convalescent fund. During 1849 there were 4261 patients. Income 400*l.*, chiefly from subscriptions. Hon. Sec., George Jeffkins, Esq.

Dispensary (*Islington*), Upper Street. Instituted 1821. During 1849, there were 4618 patients. Secretary, Mr. Bredy.

Dispensary (*Kensington*), Church Street. Established 1840. During 1849, there were 1749 patients. The income was 400*l.* Hon. Sec., E. Sheppard, Esq.

Dispensary (*London*), 21, Vine Street, Spitalfields. Instituted 1777. Secretary, T. B. Willaume, Esq.

Dispensary (*Metropolitan*), 9, Fore Street, Cripplegate. Established 1779. A charitable fund and a maternity charity are attached. During 1849, there were upwards of 10,000 patients. Income, 500*l.*; from property, 90*l.*; from subscriptions, 410*l.* Hon. Sec., Benjamin Smith, Esq., London Wall.

Dispensary (named the *Metropolitan Free Hospital*, although there is no accommodation for in-patients), 29, Carey Street, Lincoln's Inn Fields. Instituted 1836. During the year 1849 there were 10,063 patients. The income was 550*l.*, arising wholly from subscriptions. Hon. Sec., E. J. Chance, Esq., 59, Old Broad Street, City.

Dispensary (*Northern*), 9, Somers Place, West. Instituted 1810. Partly a charitable and partly a provident dispensary. Poor families subscribing 5*s.* annually have a right to the benefits. During 1849, there were 1269 patients. The income, arising wholly from contributions, 260*l.* Hon. Sec., J. Carley, Esq., 31, Guildford Street.

Dispensary (*Paddington Provident*), 104, Star Street, Cambridge Terrace. Established 1838. Families who can afford it contribute from 1*d.* to 1½*d.* weekly, according to the number of their members. During 1849 there were 2250 patients. Income, 300*l.*; from members, 150*l.*; voluntary contributions, 150*l.* Secretary, F. Ouwry, Esq.

Dispensary (*Public*), Bishop's Court, Lincoln's Inn. Instituted 1782. Patients needing it are attended at their own homes. In the year 1849, there were 6577 patients. Secretary, J. S. Phillips, Esq., 5, Bishop's Court.

Dispensary (*Queen Adelaide's*), 189, Church Street, Bethnal Green. Established 1849. Secretary, T. S. Packston, Esq., 1, Gloster Terrace, Cambridge Heath.

Dispensary (*Royal General*), 36, Aldersgate Street. Instituted 1770. Patients from all parts relieved at the institution, and the sick poor within the

City attended at their own homes. Patients in the year 1849, 14,591. Secretary, J. Wood, Esq., 8, Falcon Square, Aldersgate Street.

Dispensary (*Royal Pimlico*), Belgrave Terrace. Founded 1831. During 1849 there were 5162 patients. Income from subscriptions, 480*l.* Hon. Sec., G. W. Forster, Esq., 12, Charlwood Place.

Dispensary (*Royal South London*), St. George's Cross, opposite Bedlam. Established 1821. The largest number of patients in a single year, 4904. Income from contributions, 581*l.* Secretary, J. Hooker, Esq., Walcot Cottage, Lambeth.

Dispensary (*St. George's and St. James's General*), 60, King Street, and 3, Chapel Place North, South Audley Street. Established 1817. There is a Samaritan fund. During 1849, there were 3835 patients. Income 550*l.*, from contributions only. Secretary, J. H. York, Esq.

Dispensary (*St. John's Wood and Portland Town*), 98, St. John's Wood Terrace. Established 1845. A provident dispensary. Members entitled to the benefits of the institution pay 1*d.* per week. Relief given at the institution, or at the homes of the patients. During 1849, there were 1000 patients. The income was 240*l.*; from property, 80*l.*; contributions, 160*l.*; expenditure, 237*l.* Secretary, C. Coupland, Esq.

Dispensary (*St. Marylebone General*), 77, Welbeck Street. Instituted 1785. During 1849 there were 2142 patients. Income, 500*l.*; from property, 50*l.*; from subscriptions, 450*l.* Secretary, P. Matthews, Esq., 15, High Street, St. Marylebone.

Dispensary (*St. Marylebone Provident*), 6, Charlotte Street, Portland Place. Established 1834. Members pay from ½*d.* to 1½*d.* weekly, according to their age and station, in order to entitle them to the benefits. During 1849, there were 792 members. The income was 205*l.*; from members, 114*l.*; from contributions, 91*l.* Hon. Sec., J. Roberts, Esq., 23, Edward Street, Langham Place.

Dispensary (*St. Pancras Royal General*), 26, Burton Crescent. Instituted 1837. Patients are attended at the institution or their own homes. During 1849, there were 2336 patients. The income was 355*l.*; from property, 30*l.*; from contributions, 325*l.* Hon. Sec., T. E. Baker, Esq., 51, Burton Crescent.

Dispensary (*Surrey*), Great Dover Street, Southwark. Instituted 1777. During 1849 there were 5103 patients. Income, 960*l.*; from property, 260*l.*; from contributions, 700*l.* Secretary, Robert Meggy, Esq., 33, Trinity Square.

Dispensary (*Tower Hamlets*), 40, Commercial Road East. Instituted 1792. The annual number of patients is about 2500. Secretary, T. Stone, Esq., 6, Wellclose Square.

Dispensary (*Western*), Charles Street, Westminster. Instituted 1789. A general dispensary, and also for delivering lying-in women at their homes. During 1849 there were 7500 patients. Income, 867*l.*; from property, 154*l.*; contributions, 713*l.* Secretary, G. Western, Esq,, 4, Great Vine Street, Regent Street.

Dispensary (*Western City*), 18, Lincoln's Inn Fields. Established 1830. Each medical officer (of whom there are seven) attends the poor only of his own district at their homes, and the druggists of the charity supply the patients with medicine at 2*s.* per head. In the year 1849 there were 2000 patients. Income from contributions, 250*l.* Hon. Sec., J. M. Dale, Esq., 18, Lincoln's Inn Fields.

Dispensary (*Western General*), Lisson Grove, New Road. Instituted 1830. A general dispensary. In very extreme cases, sufferers from accidents are provided with beds. In the year 1849, there were 6000 patients. Income in 1849, from contributions wholly, 1100*l.* Secretary, James Martin, Esq.

Dispensary (*Westminster General*), Gerard Street, Soho. Founded in 1774. Lying-in women delivered at their homes. Annual number of patients about 4000. Secretary, W. J. Wills, Esq.

Ear (*Royal Dispensary for Diseases of*), 10, Dean Street, Soho. Established 1816. The deaf and dumb, and serious accidents, admitted without recommendation, and acoustic instruments supplied gratuitously. Medical officer, G. Tattersall, Esq. Secretary, H. S. Smith, Esq.

Eye (*Royal Infirmary for Diseases of*), Cork Street, Burlington Gardens. Instituted 1804. Every applicant admitted as an out-patient. For those about to undergo the operation for cataract beds are supplied in the house. A donation of 21*l.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. During 1849, there were 2671 patients; 58 were operated upon for cataract, 53 successfully. The income is from contributions, 200*l.*; from property, 100*l.* Medical officers—H. Alexander, Esq.; C. R. Alexander, Esq.; E. A. Brande, Esq. Secretary, J. Savory, Esq., 143, New Bond Street.

Eye and Ear (*Metropolitan Infirmary*), 25, Sackville Street. Established 1838. Patients without recommendations pay for their medicines. Attendance on Monday, Wednesday, and Friday, at 10. Patients during 1849, 800. Surgeon, J. Yearsley, Esq. Secretary, G. J. Soper, Esq.

Fever Hospital (*London*), Liverpool Road, Islington. Instituted 1803. Present building erected 1849. This is a hospital exclusively devoted to fever. A donation of 10*l.* 10*s.*, or a yearly payment of 1*l.* 1*s.*, constitutes a governor. Patients are admitted gratuitously, with the exception of parish paupers and servants, when one quarter is charged to the parish or master. There are 130 beds. During 1849, there were 714 in-patients. The income is 450*l.* from contribution; 450*l.* from property; 1400*l.* from parochial payments. Medical officers—Drs. Tweedie, Southwood Smith; A. Crawford, Esq.; and W. Sankey, Esq. Secretary, C. Hyde, Esq.

Fistula Infirmary, 38, Charter House Square. Instituted 1835. Especially devoted to the cure of diseases of the rectum. A donation of 10*l.* 10*s.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. During 1849, there were 520 patients. Income from contributions, 680*l.*; from property, 120*l.* Medical officers—Dr. J. J. Furnivall; F. Salmon, Esq.; H. R. Burton, Esq. Secretary, T. Leslie, Esq.

Free (*Royal*) *Hospital*, Gray's-Inn Road, founded 1828, in Greville Street, Hatton Garden, removed, 1842, to the present building, formerly the Barracks of the Light Horse Volunteers. This is one of the 12 general hospitals, and one of the most valuable institutions in London, as it is really *a free* hospital; that is to say, any sick person presenting himself at the doors is immediately, without any recommendation, received either as an in or out-patient, as the necessity of the case and the power of accommodation permit. When in the old house in Greville Street, in 1832, this hospital admitted, without hesitation, 700 cholera patients, for whom there was no other refuge. Again, in 1849, the pauper children of the Holborn Union, 154 in number, and suffering more or less from malignant cholera, were received from Tooting at the hospital. Owing to this timely relief 4 only died. In the succeeding months of cholera visitation, upwards of 300 sufferers from disease were treated as in or out-patients, without, however, diminishing the numbers relieved by the ordinary operations of the charity. Dr. Marsden was the founder, and the late Queen Adelaide and William IV. two of the great benefactors. An annual subscription of 1 guinea constitutes a governor; a donation of 10*l.* a life governor. The affairs are managed by a committee of 11 gentlemen, of whom the Reverend Edward Rice, D.D., is chairman. There are now 134 beds, with room for 500. During 1849, there were 28,611 patients; of whom 667 were in-patients.

As to the financial condition, the receipts during 1849 were 5559*l.* 13*s.* 4*d.*, only 55*l.*, of which was from property. The expenditure for the year was 4800*l.* The rest of the income was employed in paying off arrears of expenditure in the two previous years. Thus the income now more than covers the expenditure, and the debt is less than 5000*l.*; 3000*l.* for mortgage for the purchase of the premises, the rest arrears of 1848 and 1849.

The medical officers are—W. Marsden, Esq.; John N. Heale, Esq.; J. Gay, Esq.; T. Wakley, Esq.; T. W. Cooke, Esq.; the Rev. E. Rice, D.D., Chairman.

Gentlewomen, Establishment for, during Illness, 76, Harley Street. Now forming.

George's (*St.*) *Hospital*, Hyde Park Corner, Grosvenor Place, was originally instituted by some seceding governors of Westminster Hospital, 1733, as an infirmary, in Lanesborough House, which was where the present building stands, and then contained only 60 beds. The present institution was incorporated 1824, and the present edifice built by Wilkins in 1829. In this hospital every disease that is not incurable or contagious, with the exception of venereal disorders, is treated; and there is a Samaritan fund, called St. George's Charity, for convalescents. Among the chief benefactors is the late Sir Thomas Ap Reece. There is also a medical school. The celebrated names connected with this institution are those of Dr. Baily, Dr. W. Hunter, John Hunter, who died here suddenly, having been violently excited by a quarrel in the board-room, while suffering under disease of the heart, Mr. Wilson, Sir Benjamin Brodie, Sir Everard Home; all medical officers of the hospital, and teachers at the school.

The governors are donors of 50*l.*, or annual subscribers of 5 guineas, each of whom may have 1 in-patient and 2 out-patients always on the books. Governors of the St. George's Charity give 10 guineas, or subscribe 1 guinea annually.

Patients admitted by governor's letter on Wednesday, at half-past 11; accidents, &c., freely admitted at all times. There are 350 beds. The number of patients treated during 1849 was 11,586, of whom 3643 were in-patients; of these 250 died.

The income is under 7500*l.*, only 3000*l.* of which arises from property. The medical officers are—Dr. Wilson; Dr. Nairne; Dr. Page; Dr. Bence Jones; Dr. Pitman; Dr. Fuller; Robert Keate, Esq.;

Cæsar Hawkins, Esq.; Edward Cutler, Esq.; Thomas Tatum, Esq.; H. C. Johnson, Esq.; Prescott Hewett, Esq. Secretary, J. Gunning, Esq.

German Hospital, Dalston. Opened 1845. A special hospital for all who speak the German language. The hospital for in-patients is at Dalston; out-patients attend at the dispensaries in London; Office, 17, Broad Street Buildings. Though not exclusively for Protestant patients, the chaplain is a Protestant, and the establishment itself has a Protestant character. There is a convalescent fund; and a Sanatorium for convalescents, where private rooms are afforded to the middle classes, upon payment of a weekly sum, varying from 1 to 2 guineas. A donation of 30 guineas, or a yearly payment of 3 guineas, constitutes a governor. Applicants examined every day at 2 o'clock. During 1849, there were 419 in-patients, and 1728 out-patients. Medical officers—Dr. Sutro; Dr. Swaine; Dr. Straube; Dr. Beneke. Assistant-Secretary, G. H. Lillie, Esq.

Glandular Institution, 20, Clifford Street, Bond Street. Established 1820, for the treatment of cancer, scrofula, &c. Attendance daily at the institution, or at the homes of the patients. Honorary Secretary, F. K. Jones, Esq., 10, Brunswick Square.

Guy's Hospital, Southwark. Founded and endowed at the sole expense of Thomas Guy*, a bookseller, in Lombard Street, who, though 76 years old when the building was begun, lived to see it completed in 1724, when he was 80 years of age. The building cost 18,793*l.*, and the endowment amounted to 219,499*l.* Another gentleman, Mr. Hunt, of Petersham, followed Mr. Guy's example, and, at his death in 1829, left 200,000*l.* to the hospital, stipulating for accommodation being afforded to 100 patients. There is a bronze statue of the founder in the front-court, and a marble one in the chapel. There is a lunatic house attached, with gardens, &c., for the reception of 30 patients, and a medical school, with museums, libraries, &c. &c. The government of the hospital is vested in 60 self-elected governors, no contribution being necessary; there is no published list of them. Among the many eminent names connected with the hospital is that of Sir Astley Cooper, who was both surgeon and lecturer there; he is buried within the chapel.

Patients suffering under any curable disorder admitted without any recommendation, on Wednesdays at 10 o'clock, accidents at any time. There are 580 beds. The income is between 25,000*l.* and 30,000*l.*

The medical officers are—Dr. Richard Bright; Dr. T. Addison; Dr. B. G. Babington; Dr. G. H. Barlow; Dr. Henry M. Hughes; Dr. G. O. Rees; Dr. Golding Bird; Bransby B. Cooper, Esq.; Edward

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* Guy's fortune, though ostensibly made by the sale of bibles, more probably resulted from successful speculations in South-sea stock. The Hospital is indebted for his munificence to a curious circumstance. It seems he had agreed to marry a female servant, who offended him by having some pavement repaired contrary to his orders; he therefore renounced his engagement, and devoted his fortune to founding this hospital. He had before been a large benefactor to St. Thomas's.

Cock, Esq.; J. Hilton, Esq.; John Birkett, Esq.; and Alfred Poland, Esq. Clerk Reg., Mr. John S. Taylor.

Hanwell, Lunatic Asylum for the County of Middlesex. One of the four metropolitan lunatic asylums. (See "Lunatic Asylums.") Queen Adelaide's fund is for the relief of the destitute on their discharge. There are 994 beds. The income arises from county and parish rates. The amount of Queen Adelaide's fund is now about 13,000*l.* Medical officers—Dr. Conolly, Dr. Begley, and Dr. Hitchman. Clerks, J. Morrison, Esq., and Charles Wright, Esq.

Homœopathic Institutions.—There are four establishments founded upon the Homœopathic system of treatment: one at 17, Hanover Square; one at 2, London Street, Fitzroy Square; one at 63, Edgeware Road; and one at 22, Davies Mews, Lower Brook Street.

Idiots, Asylum for. It is one of the four asylums for mental diseases, and is more fully described under "Lunatic Asylums." It was instituted 1847. The office is at 29, Poultry, and the asylum at Park House, Highgate. There are 60 beds. Medical officers—Dr. Conolly, Dr. Little, and Dr. Foreman. Acting Secretary, W. Nicholas, Esq., 29, Poultry.

Invalids, Confirmed Female, Home for, Bird-cage Fields, Stamford Hill. Office, 64, Old Broad Street. Established 1842. Most of the patients are able to contribute 6*s.* or 8*s.* a week, and are not admitted without a subscriber's testimony to good character, and an undertaking to remove when required, or in case of death. The management is in the hands of a committee of ladies. A donation of 10*l.*, or an annual subscription of 1*l.*, entitles to recommend cases. Secretary, John Foster, Esq.

Invalids, Asylum for respectable Females, High Street, Stoke Newington. Established 1825. For shop-women, servants, and others in dependent situations, whom illness has compelled to leave their places. A recommendatory letter from a subscriber, and a certificate of good conduct from a subscriber, or two housekeepers, and 1*l.* 1*s.* entrance fee are necessary to procure admission. This, however, only lasts for one month. A donation of 10*l.* 10*s.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. Medical officers—Drs. Cobb, Cohen, and Dewsbury; W. Kingdom, J. Reynolds, and F. Tomlinson, Esqrs. Secretaries, Mrs. Reynolds and Miss L. Bradshaw.

King's College Hospital, Portugal Street, Lincoln's-Inn Fields, is one of the 12 general hospitals, and in connection with the medical school of King's College. Founded in 1839. By this institution relief is given in the hospital, and to out-patients attending at the hospital; patients who need it, and lying-in women, are attended at their own homes. It is situated in a very poor and populous neighbourhood; of whom it is said it annually relieves one-twentieth. A donation of 30 guineas, or an annual subscription of 3 guineas, constitutes a governor; an annual subscriber of 1 guinea, or a donor of 10 guineas, is entitled to recommend 1 in-patient and 2 out-patients yearly.

Admission by governor's letter; but a great number of cases are admitted without recommendation. There are 120 beds. During the year 1849, there were 1253 in-patients, and 19,383 out-patients. The income is about 4000*l.*, only 200*l.* of which arises from property. The medical officers are—Drs. T. Watson, R. Ferguson, G. Budd, R. B. Todd, Arthur Farre, W. A. Guy, Geo. Johnson; and W. Fergusson, R. Partridge, W. Bowman, and Henry Lee, Esqs. Secretary, John Lyon, Esq.

Lock Hospital and Asylum, Westbourne Green, Harrow Road. A special hospital for the treatment of patients suffering under the venereal disease; and an asylum for the reception of penitent females cured therein. The former was instituted in 1746, and was situated in Grosvenor Place; the latter was founded by the Rev. Thomas Scott, the commentator, and was next door to the hospital. In 1842 both institutions were removed to the present building. The name is derived from loques or locks of hair, lint, or rags applied to sores, and a loke or lock formerly signified a lazar-house or hospital for lepers, of which there were formerly several in London. This is the only institution in London which *professedly* admits patients affected with this disorder, affording medical treatment and a penitentiary refuge at the same time. The chapel is a source of revenue to the hospital, and the chaplain is generally a noted preacher. Pupils are admitted. 50*l.* donation, or 5*l.* 5*s.* yearly, constitutes a governor, who may always have one patient in the house. An annual subscriber of 2*l.* 2*s.*, or a donor of 20*l.*, may recommend one in and three out-patients yearly. All patients admitted freely on their first application; none a second time. The number of beds is 60 in the hospital, and 100 in the asylum. In 1849 there were treated 382 in-patients, and 443 out-patients. The receipts are about 2200*l.*; 200*l.* from the chapel, the rest from voluntary contribution. The medical officers are—Dr. Augustin Sayer; E. Cutler, Esq.; S. Lane, Esq.; and H. Lee, Esq. Chaplain, the Rev. Thomas Garnier. Secretary, W. Irving Hare, Esq.

London Hospital, Whitechapel Road. Instituted 1740; incorporated 1759. A general hospital for the relief, both as in and out-patients, of the sick poor who are properly recommended, except parish poor or soldiers, who cannot be admitted unless the person recommending them agrees to contribute 9*d.* a day. There is a Samaritan fund for assisting poor patients who have been cured, and for sending convalescent patients to the Sea-bathing Infirmary. There is a medical school.

Governors are donors of 30 guineas, or subscribers of 5 guineas yearly; and they are each entitled to have 1 in-patient and 4 out-patients always on the books. Subscribers of 1 guinea annually may recommend out-patients. A donation of 5 guineas, or an annual subscription of 1 guinea, constitutes a member of the Samaritan fund. Admission by governor's letter; urgent cases at all times; out-patients attended to every day.

There are 330 beds. 33,000 patients were treated last year; of whom 4185 were in-patients. The income is about 13,000*l.*; 11,000*l.* arising from property. The expenditure has, for the last 10 years, exceeded the receipts; in 1849 it was 1980*l.* in excess. The medical officers are—Drs. F. Cobb, A. Frampton, W. J. Little, J. Pereira, P. Fraser, Herbert Davies; J. Luke, John Adams, T. B. Curling, George Critchett, N. Ward, J. C. Wordsworth, Esqs. Secretary, Wm. J. Nixon, Esq.

Luke's, St., Hospital for Lunatics, Old Street Road. Instituted 1751. It is one of the four public metropolitan lunatic asylums, and is fully described under "Lunatic Asylums." Pauper lunatics are admitted upon payment of 4*l.* each, and some incurable patients at 7*s.* per week. A donation of 31*l.* 10*s.*, or a yearly subscription of 7*l.* 7*s.*, constitutes a governor. There are 260 beds. The income is 8500*l.* from subscribers, and 5000*l.* from property. Medical officers—Dr. A. R. Sutherland, Dr. A. J. Sutherland, Dr. F. R. Phelp; and J. Luke, Esq. Secretary, G. Mence, Esq., 5, Billiter Street.

Lungs, Royal Infirmary for Diseases of, City Road. Established 1814. A special dispensary for the relief of the above diseases. Secretary, S. Amory, Esq., 25, Throgmorton Street.

Lying-in Hospital, the British, Endell Street, Long Acre. Instituted 1749. It was formerly in Brownlow Street, and removed to the present new building in 1849. It is the oldest lying-in hospital in London. It is solely for married women, who are either admitted into the hospital as in-patients, or are attended at their own homes. A donation of 10*l.* 10*s.*, or an annual subscription of 1*l.* 1*s.*, constitutes a governor. There are 40 beds. The income is now below the expenditure, owing to the outlay of 6000*l.* on the new building. Medical officers—Drs. Henry Davis and R. Lee; B. Brookes, Esq.; and J. Clarke, Esq., Secretary, R. Davies, Esq.

Lying-in Hospital, City of London, Old Street, City Road. Instituted 1750 in Aldersgate Street; removed to the present building in 1773. A special hospital for lying-in women, *married,* or *recently widows.* Patients stopping in the hospital for more than 48 hours before their delivery, pay 1*s.* 6*d.* per day. A donation of 21*l.* constitutes a governor; every donation of 4*l.* 4*s.*, or yearly subscription of 1*l.* 1*s.*, confers the right of recommending one patient. The number of beds is 40; the number of patients admitted annually, 500; Medical officers—Dr. Conquest; W. Coulson, Esq.; and H. James, Esq. Secretary, J. Clift, Esq., 30, Bloomsbury Square.

Lying-in Hospital, General, York Road, Lambeth. Instituted 1765. Incorporated 1830. Women are admitted into the hospital, or attended at their own homes. Single women admitted *once.* A donation of 31*l.* 10*s.*, or an annual subscription of 3*l.* 3*s.*, constitutes a governor, who has the privilege of recommending three in and three out-patients yearly. Medical officers—Dr. Locock; Dr. Cape; Dr. Reid; and J. South, Esq. Secretary, W. W. Hastings, Esq.

Lying-in Hospital, Queen Charlotte's, Lisson Green. Instituted 1752. Lying-in women admitted as in-patients or attended at their own homes. Unmarried women admitted *once.* In 1849, the number of beds was 20. In-patients admitted, 240; out-patients, 400. Medical officers—Dr. Roget; Dr. Moore; Dr. Brown; G. Gream, Esq.; J. Cholmondeley, Esq. Secretary, A. U. Thistleton, Esq.

Lying-in Hospital, Queen Adelaide's, Queen Street, Golden Square. Established 1824. This institution is chiefly for affording medical attendance to lying-in women at their own homes, but a few are received as in-patients. In 1849, the number of patients was 1000. The medical officers are—Dr. J. A. Wilson; Dr. H. Davies; S. Lane, Esq.; W. H. Yell, Esq.; T. Stillman, Esq.; and W. Rochfort, Esq. Hon. Secretary, T. Stillman, Esq.

Lying-in Institution, 90, Newman Street. Established 1787. A special institution for delivery of *married* women at their own homes. The number of women attended in the year 1800 was 200; the number last year, 300. Secretary, W. Woolmer, Esq.

Lying-in Institution, Queen Adelaide and British Ladies', 13, Chapel Street, Cavendish Square. Established 1829. This is an institution for delivering married women, who reside within the western districts of London at their own homes, and for supplying them with medicines and linen during their confinement. An annual subscription of 1*l.* 1*s.* entitles the subscriber to recommend two cases for medical attendance, and four for the loan of linen. Secretary, B. G. Beale, Esq.

Lying-in and Sick Dispensary, Charlotte Street, 10, Russell Place, Rathbone Place. Instituted 1778. For the delivery of married women, and also for the relief generally of the sick poor at their own habitations, in London and Westminster. Patients with recommendations received between 9 and 11 o'clock every morning (Sundays excepted). The annual average number of patients is 600. One guinea annual, or 10 guineas donation, entitles to recommend 2 patients. Secretary, John Robinson Wells, Esq., Wimpole Street.

Marylebone Hospital, Cambridge Place, Paddington. One of the 12 general hospitals. It is only lately opened. There are at present 150 beds, but it is proposed to have 400. The amount raised by subscription for founding this hospital, which is much needed in this thickly-peopled locality, is 30,000*l.* A donation of 31*l.* 10*s.*, or an annual subscription of 3*l.* 3*s.*, constitutes a governor. Hon. Secretary, W. Tatham, Esq., 61, Oxford Terrace.

Maternity Charity, The Royal, Office, 17, Little Knight Rider Street. Instituted 1757. This institution is for the delivery of married women at their own homes, and its benefits are extended to any place within three miles of St. Paul's. A donor of 10*l.* 10*s.*, or an annual subscriber of 1*l.* 1*s.*, may recommend 8 patients yearly. The average annual number of cases is 3500. The income is about 1830*l.* Secretary, Dr. Raymer.

Middlesex Hospital, Charles Street, opposite Berners Street, is one of the 12 general hospitals. Established in 1745, when it contained only 18 beds, which were increased to 70 in 1800; to 179 in 1815; and now, the hospital having been assisted by various bequests, the building has been recently enlarged, and has 285 beds. All curable disorders are treated; and there is a special ward for cancer, endowed by Samuel Whitbread, Esq. There is a Samaritan fund for assisting the poor who have been cured, or sending convalescents to the Invalid Asylum at Carshalton. Sir John Murray left 10,000*l.* in 1848. There is a medical school attached.

The governors are donors of 30 guineas, or annual subscribers of 3 guineas. For every 2 guineas of yearly subscription, 1 in-patient and 3 out-patients may be recommended. The regular day for admission by subscribers' order is Tuesday. Cases of emergency are freely admitted at any time. The annual average number of in-patients is 2206, and 9316 out-patients. The annual income is about 9500*l.*, 6500*l.* arising from property.

The medical officers are—Dr. F. Hawkins; Dr. M. Crawford; Dr. Seth Thompson; and Dr. A. P. Stewart. Surgeons.—C. De Morgan, Esq.; C. H. Moore, Esq.; Alexander Shaw, Esq.; M. Henry, Esq. Secretary, Alexander Shedden, Esq.

Nurses, Establishments for the Training of.—There are two institutions of this kind in the metropolis; although they hardly come under the title of "Hospitals, &c.," yet they are of a nature sufficiently connected with sanatory establishments to justify their mention at least in this place. Their names indicate the purpose for which they are founded. One is called "The Institution of Nursing Sisters," and is at 16, Broad Street Buildings; 28 nurses are employed, and those who are in need of their attendance may be supplied with them upon application to the Secretary, Mrs. Gurney. The other establishment is called the "Training Institution for Nurses for Hospitals, Families, and the Poor." It is at St. John's House, 34, Fitzroy Square. The Director is the Rev. F. W. Twist.

Rupture Society, 22, Lincoln's Inn Fields. Instituted 1804. Patients of both sexes suffering under rupture are supplied with advice, and the necessary trusses and instruments, upon applying with a letter of recommendation, at 26, Grosvenor Street, before 9 in the morning. A donor of 10*l.* 10*s.*, or a yearly subscriber of 1*l.* 1*s.*, is entitled to recommend patients. In 1849, the number of patients relieved was 1047. The income from contributions is about 3500*l.* Secretary, John Porter, Esq.

Sanatorium in the Island of Madeira, Office, 4, St. Martin's Place. This is an institution only projected in 1849, and intended to supply persons of narrow means, who are labouring under pulmonary complaints, with a passage to Madeira, and a residence there, with good medical advice, if after proper examination it seems probable that by such means they will be permanently benefited. The expenses are to be partly defrayed by the patients themselves. A donor of 10*l.* 10*s.*, or a yearly subscriber of 1*l.* 1*s.*, is to have the privilege of placing one person on the list to be submitted to the medical opinion of the officers of the institution. Hon. Secretary, W. Haly, Esq.

Sea-Bathing, Royal Infirmary, Office, 35, Cannon Street. Instituted 1796. This institution has been usually ranked among the metropolitan hospitals, as its office and governing body are in London; the infirmary itself, however, is situated at Westbrook, near Margate. It is intended to afford sea-bathing and general medical attendance to scrofulous patients, and has been very beneficial in its effects. The recommendation of a governor is necessary to candidates, who must be also approved of by the medical officers as proper objects for admission. Patients under 10 years of age pay 4*s.* per week for board; those above that age, pay 5*s.* A donation of 10*l.* 10*s.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. There are 230 beds. The annual average number of patients is 700. Secretaries,—in London, J. Paul, Esq.; at Ramsgate, W. A. Hunt, Esq.

Seamen's Hospital Society, Office, 74, King William Street, City. Established 1821. The hospital is the "Dreadnought" line-of-battle ship, off Greenwich, and is for the reception of the sick seamen of all nations in the port of London. Besides medical relief, clothes and other necessary articles are given to those who stand in need of them when quitting the hospital. A donation of 10*l.* 10*s.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. There are 200 beds. In 1850, the number of in-patients was 2274, out-patients, 1528. The income is about 8146*l.*, of which 2755*l.* arises from property, 1150*l.* is received from the Board of Trade, under the Mercantile Marine Bill, and the rest from voluntary contributions. Her Majesty, the Emperor of Russia, the Queen of Spain, and the King of Hanover, are subscribers to this valuable institution; and among the vice-presidents is his Excellency Keying, Imperial High Commissioner to the Emperor of China. The expenditure at present exceeds the income by 400*l.* Medical officers—Dr. Seymour; Dr. G. L. Roupell; Dr. G. Budd; Dr. Black; Dr. Blackall; Dr. Rooke; George Busk, Esq.; and Mr. Lakin. Secretary, S. K. Cooke, Esq.

Skin, Hospital for Diseases of the, 25, Bridge Street, Blackfriars, founded 1841, for the reception of poor persons suffering under cutaneous complaints, to whom it is open *free* daily for out-patients, who are supplied with advice, medicines, and appropriate medical baths, of which this institution possesses a more extended suite than any other public charity. In-patients are admitted by the committee only. The annual attendance is upwards of 7000. Physicians, Dr. Southwood Smith and Dr. Hodgkin; Surgeon and Founder, James Startin, Esq.; Assistant Surgeon, A. M'Whinnie.

Small-Pox and Vaccination Hospital, Upper Holloway, Highgate Hill. Instituted 1746. A hospital specially devoted to the objects indicated by its title. Any person suffering under small-pox is instantly admitted upon a governor's recommendation. The parents or nurses of children under five years of age are admitted upon the payment of 1*s.* 6*d.* a day for their board. A donation of 10*l.* 10*s.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. There are 70 beds. In 1849, the number of patients admitted was 490, of whom 90 died. Medical officers—Dr. Gregory and J. Marson, Esq. Secretary, S. Clift, Esq.

Spanish and Portuguese Jews' Hospital, Mile-end Road. Established 1747. This institution is in the widest sense a *general* hospital, as it affords relief to in-patients and out-patients of all kinds, receives lying-in women, and supplies an asylum to the aged and infirm. A donation of 10*l.* 10*s.*, or a yearly subscription of 1*l.* 1*s.*, constitutes a governor. The income from voluntary contributions is 700*l.*; from property, 300*l.* Secretary, Solomon Almomino, Esq.

Ophthalmic Hospital, Central London, 1, Calthorpe Street, Gray's Inn Road. Established 1843. The only in-patients admitted are those requiring operation; a governor's recommendation is in such cases necessary, and usually the payment of the patient's board. The annual average number of patients is 2000. Secretary, R. J. Child, Esq., 25, Blandford Street.

Ophthalmic Institution, North London, 31, Charlotte Street, Portland Place. Instituted 1841. For the treatment of diseases of the eye. Urgent cases are admitted into the house. The number of patients in 1849 was 1134. The income is 130*l.*, derived solely from contributions.

Ophthalmic Hospital, Royal London, Moorfields. Established 1804. A special hospital for diseases of the eye. In 1849 there were 8000 out-patients, and 200 in-patients. Income from contributions, 400*l.*; from property, 400*l.* Secretary, F. A. Curling, Esq.

Ophthalmic Hospital, Royal Westminster, Chandos Street, Charing Cross. Instituted 1816. All patients suffering under diseases of the eye relieved without recommendation. Cases requiring operation are admitted as in-patients. During 1849, the number of in-patients was 187; out-patients, 4205. The income from contributions is 450*l.*; from property, 150*l.* Secretary, T. R. Fowler, R.N.

Orthopodic Royal Hospital, 6, Bloomsbury Square. Founded 1840. A special hospital for the treatment of club-foot, curvature of the spine, and other deformities. A peculiarity of this institution is that, by paying 10*l.*, a patient may be at once admitted and accommodated with an extra bed if the ordinary number is already occupied. There are 36 beds. The number of patients in 1849 was 1200. The income from contributions is about 1500*l.* Secretary, B. Maskell, Esq.

Thomas's (*St.*) *Hospital,* High Street, Southwark.—One of the 5 Royal foundations. Founded 1213, by Richard, Prior of Bermondsey, as an alms-house. Refounded 1215, by Peter de Rupibus, Bishop of Winchester. On the dissolution of monasteries, it passed into the possession of the Corporation of London, by whom it was opened as a general hospital, 1552. Rebuilt, at a great expense, by public contribution, 1706. Thomas Frederic Eyer and Thomas Guy (the founder of Guy's Hospital) being two of the greatest benefactors. Two wings were built at the same time as the approaches to New London Bridge. There is a bronze statue of Edward VI., by Scheemakers, and one of Sir Robert Clayton. The governors are donors of 50*l.*; special governors are elected retired officers and the executors of benefactors.

There is a medical school attached.

Patients suffering under any curable disease admitted on Tuesdays at 10 o'clock, upon presenting a petition (which may be received at the office), signed by a housekeeper, who engages to remove on discharge, or death, or pay 1*l.* 1*s.* for the funeral. Urgent cases admitted at all times. Some patients are assisted with clothes, &c., at their departure. There are 428 beds. During 1849, the number of patients under treatment was 59,710; of these, 5013 were in-patients; 276 died. The income averages 25,000*l.*; arising almost wholly from property.

The medical officers are—Dr. T. A. Barker, Dr. H. B. Leeson, Dr. J. R. Bennett, Dr. R. H. Goolden, Dr. W. Cohen, Dr. T. B. Peacock, Joseph H. Green, John F. South, G. W. Mackmurdo, Esqs.; S. Solly, J. Dixon, F. Le Gros Clark, G. R. Whitfield, Esqs. Clerk, Robert A. Wainewright, Esq.

Truss Society, National, 74, King William Street, City. Instituted 1786. An institution for the treatment of rupture generally in both sexes, and for supplying trusses and other instruments. Secretary, H. Swift, Esq.

Truss Society, City of London, 76, Queen Street, Cheapside. Instituted 1807. For the medical treatment of rupture, and the supply of the necessary trusses and instruments. The number of patients relieved annually is about 5000. Secretary, T. Eglinton, Esq.

University College Hospital, Upper Gower Street.—One of the 12 general hospitals, in connection with University College, founded in 1833. North wing built in 1846. It was established, among other reasons, for affording means of instruction to the medical students of the college. The governors are a committee of the Council of the College. Besides relief to in-patients and out-patients, this institution furnishes attendance to midwifery cases out of the hospital. Mr. Liston, the eminent surgeon, was attached to this hospital and school. Yearly subscribers of 1 guinea, or donors of 10 guineas, may recommend 4 out-patients; annual subscribers of 3, or donors of 30 guineas, may recommend 3 in, and 6 out-patients yearly. Patients with letters admitted daily at 11 o'clock; cases of emergency at all hours. The number of beds is 120. During 1849, there were admitted 1634 in-patients; 1940 out-patients.

The income is 3500*l.* from voluntary contributions; 1500*l.* from property.

The medical officers are—Dr. W. H. Walshe, Dr. E. A. Parkes, Dr. A. B. Garrod, Dr. Jenner, Dr. Hare, Dr. E. W. Murphy. Surgeons, R. Quain, Esq.; E. J. Erichsen, Esq.; John Marshall, Esq.; Will. Cadge, Esq. Clerk to the Committee, J. W. Goodiff, Esq.

Vaccine Establishment, National, 8, Russell Place, Fitzroy Square. Established 1809. This is a government establishment; and, although not a hospital, in any sense of the word, it has been classed among them, as affording means of preventing, if not of curing disease. It is for the distribution of vaccine lymph to medical men, who are bound to report the numbers vaccinated by the supplies they receive. During 1849, 11,790 children were vaccinated through its means.

Vaccine Institution, Royal Jennerian, 18, Providence Row, Finsbury Square Established 1806. It is for the same purpose as the preceding institution. There are different vaccinating stations in connection with it. The number of children vaccinated by its means in 1849 was 7051. Income from contributions entirely, 300*l.* Secretary, C. Chantry, Esq.

Verrall's Charitable Society for the Treatment of Distortions, Diseases of the Spine, &c., &c., 84, Norton Street. Established 1836. Patients are received into the house, but they have to pay a small fixed weekly sum for their board; and there is also an asylum at Eastbourne for those requiring sea-air. Secretary, C. Verrall, Esq.

Spinal Institution, Harrison's, 2, Middlesex Place, Paddington. There are six beds. Secretary, Charles Musgrave, Esq.

Westminster Hospital, Broad Sanctuary, opposite Westminster Abbey. Instituted 1719. It was the first hospital which depended on voluntary contributions. Present building erected 1832. Incorporated 1836. It is a general hospital, for the treatment of all curable disorders. There is a lithotriptic fund of 1319*l.*; and a ward for the reception of patients suffering under stone. There is also an "incurable patients'" fund, producing 503*l.* per annum, for the maintenance, clothing, and nursing of 7 incurables.

There is a medical school attached.

The governors are annual subscribers of 3 guineas, and donors of 30*l.* Every guinea yearly subscription, or 10*l.* donation, entitles to recommend 1 in-patient and 2 out-patients annually.

Patients admitted by letter of recommendation on Tuesdays, at 1 o'clock; urgent cases at once. The number of beds is 174; but there are 3 wards unoccupied, with room for 50 additional beds, which, however, cannot be supplied through deficiency of funds.

During the year 1849, there were admitted 2000 in-patients and 13,000 out-patients. The annual average is 16,000 of all kinds.

The income is about 4000*l.*, half of which arises solely from voluntary contributions. For 1500*l.* a year additional the unoccupied wards might be put into a state of efficiency; and this is much to be desired, as this neighbourhood is greatly in need of hospital accommodation, as is evidenced by the number of cases which are necessarily refused admission from want of room. The medical officers are—Dr. John Bright, Dr. G. H. Roe, Dr. P. N. Kingston, Dr. W. R. Basham, Dr. J. W. Woodfall, G. J. Guthrie, Esq., W. B. Lynn, Esq., F. Hale Thomson, Esq., B. Phillips, Esq., Barnard W. Holt, Esq. Secretary, F. J. Wilson, Esq.

Women, Hospital for, Red Lion Square. Instituted 1843. This hospital is solely for the treatment of diseases peculiar to women. In 1849 the number of in-patients admitted was 53. The income is 1000*l.* from contributions. Hon. Sec., E. Futvoye, Esq.

Women and Children, Free Hospital, 7, North Audley Street. Founded 1847. Women suffering under diseases peculiar to the sex receive advice and attendance as out-patients. It is also a Samaritan institution, or maternity charity. During 1849 there were 6000 patients. Secretary, A. H. Moore, Esq.

Women and Children, Paddington Free Dispensary for, 8, Market Street, Edgeware Road. Established 1848. There are no paid officers; and no recommendation is required from applicants for medical relief. There are 300 patients. A donation of 10 guineas, or a yearly subscription of one guinea, constitutes a governor. Secretary, W. Dickinson, Esq.

INNS OF COURT

(Anciently the Aula Regia, or Court of the King's Palace) are the venerable seats of learning, of our customs and our domestic history, and, from time immemorial, the residence of legal subtilty. Four of these Inns of Court claim the highest distinction. The Inner and Middle Temple, Lincoln's Inn, and Gray's Inn, hold in conference the privilege of electing or rejecting students who are proposed to them as barristers-at-law, which is done by the student furnishing a statement in writing, describing his age, residence, and condition in life, and accompanied by a certificate of his fitness, signed by himself and a bencher of the society, to whom his application is addressed, or two barristers. The intended student is expected to be a gentleman, to be educated a degree in advance of those of ordinary men. In entering either of the four Inns of Court he must pay fees which usually amount to more than 100*l*., attend the term dinners a prescribed number of times, to be qualified for election; and if received, he is then, as is usually said, "called to the bar," and so declared. To be successful as a barrister he must be studious in reading, diligent in his attentions to the proceedings in the courts of law, and watch the progress and termination of cases therein determined; he should be courteously becoming to his superiors, urgent in his application, and forcible in argument for his client. Success and the highest honours then will await him in his profession. The names of "Inns" are as follows:—Barnard's Inn, in Holborn, near Fetter Lane; Clement's Inn, near St. Clement's Church, Strand; Clifford's Inn, Fleet Street, near Temple Bar; Furnival's Inn, Holborn, opposite to Barnard's Inn; Gray's Inn, High Holborn; Lincoln's Inn, Old Square; Lincoln's Inn, New Square; Lincoln's Inn, Stone Buildings; Lyon's Inn, Newcastle Street, Strand; New Inn, adjacent to Clifford's Inn; Staple Inn, Holborn Bars; Serjeants' Inn, Chancery Lane; Serjeants' Inn, Fleet Street; Symond's Inn, Chancery Lane; Temple, Inner; Temple, Middle; Thavies Inn, Holborn, near St. Andrew's Church.

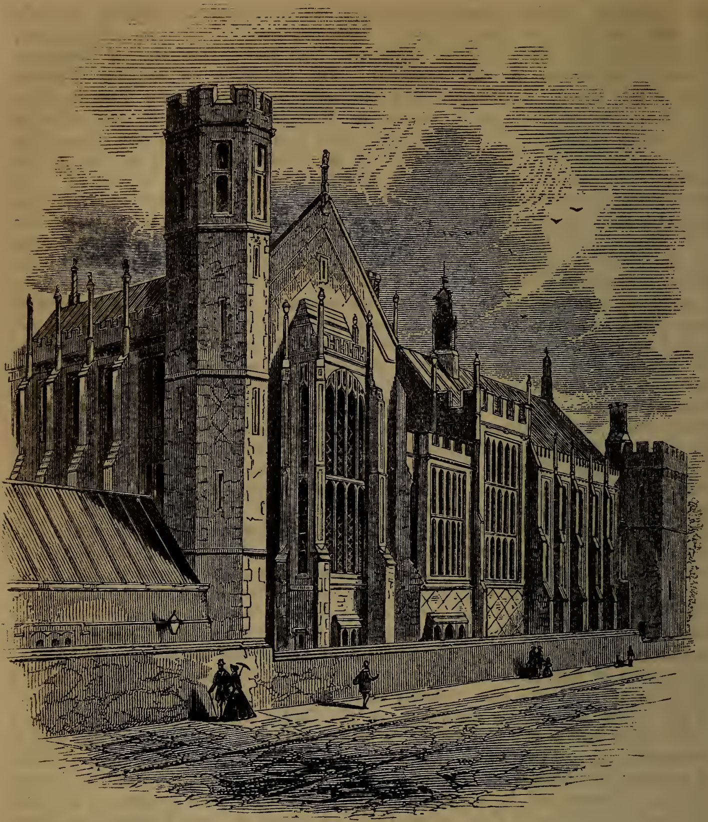
The Inner Temple Inn has three inns attached—Clifford's Inn, Clement's Inn, and Lyon's Inn. The entrance is by an ancient gateway opposite Chancery Lane. The ancient buildings of the Temple were destroyed in the great fire of London, but the Round Church was saved. It was previously divided into the Inner, Middle, and Outer Temples. These institutions have great antiquity, having been the principal establishment in England of the Knights Templars; some of the most eminent and learned men in legal and constitutional history have had chambers and residences here. There is a dining-hall and a library for the benchers. The hall has interesting portraits of King William and Queen Mary, and the Judges Coke and Littleton, and ornamented with paintings by Sir James Thornhill. The church is one of the four round churches in England; for its description see pages 135 and 140, and "Illustrations of the Architecture of the Temple Church," 4to, 1845. There are very pleasant gardens on the banks of the Thames, south of the immense range of buildings forming the Inner and Middle Temple. These gardens are exceedingly pleasant, both for their open space and the view therefrom.

The benchers kindly permit strangers to promenade. Middle Temple Inn had attached two inns of court—New Inn and Strand Inn. The latter, pulled down by the Protector Somerset, was partly the site of Somerset House; the former is still retained. The entrance of Middle Temple Lane, Fleet Street, is attached and embodied with the Inner Temple Inn. The great hall of the society, known as Middle Temple Hall, was built in 1572, while Plowden, the well-known jurist, was treasurer of the inn. The roof is a splendid example of the time of Queen Elizabeth, and so is the screen. This hall is of remarkable beauty, and may easily be viewed. On the stained glass windows, and in the panels, may be observed names of remarkable men in our history—Sir Walter Raleigh, Sir Thomas Overbury, Sir John Davys, Lord Chancellor Clarendon, Bulstrode Whitelock, Ireton, son-in-law to Oliver Cromwell, Evelyn, Lord-Keeper Guildford, Lord Chancellor Somers, the dramatists Wycherley, Ford, Shadwell, Congreve, &c. (see p. 506).

Lincoln's Inn has two Inns of Chancery attached, Furnival's Inn and Thavies Inn. Took its name from Henry de Lacy, Earl of Lincoln, 1312, whose Inn occupied the greater portion of the site of the present Inn, divided as it now is into Old Square, New Square, and Stone Buildings. The entrance from Chancery Lane into Old Square is by the curious brick gatehouse, built, in 1518, by Sir Thomas Lovell. The two squares (old and new), have numerous chambers, which were the residences of some of our eminent men, Judge Fortescue, Sir Thomas More, Lord Keeper Egerton, Oliver Cromwell, Attorney-General Noy, Dr. Donne, Pynne, Sir Henry Spelman, Sir Matthew Hale, Sir John Durham, Rushworth, Lord Shaftesbury, Lord Mansfield, Lord Erskine. The great secretary, Thurlow, resided here from 1645 to 1659; after his death, the Thurlow Papers were accidentally discovered. There are the Lord Chancellor's and Vice-Chancellor's Courts. In the former, the Old Hall, the Lord Chancellor holds his sittings, after term. It is a spacious room, 62 ft. by 32 ft., and is the room in which formerly the dinners were held. The sitting courts of the Vice-Chancellors are modern and meagre buildings. But one of the finest of its kind is the range of buildings in Lincoln's Inn Gardens—the "Hall," finished in October, 1845, occupying the ground of nearly the whole eastern side of the square of Lincoln's-inn-Fields, being the court, hall, and library, of the benchers of Lincoln's Inn, recently built by Mr. Philip Hardwick, architect, of red brick with stone dressings, in the Tudor style of the time of Henry VIII. The hall is 120 ft. long, 45 ft. wide, and 62 ft. in height. The roof is of carved oak. The library is 180 ft. long, 40 ft. in width; the cost, upwards of 60,000*l.* The library contains a large assemblage of books, several of which are valuable, surrounded by a gallery with shelves filled with books; in the hall is Hogarth's picture of Paul before Felix—a statue of Lord Erskine, by Sir R. Westmacott. The western side of this building is very attractive from the square, and our cut represents a north-western view of the same (see p. 530).

Lincoln's Inn Chapel, the chapel belonging to the benchers of Lincoln's Inns of Court, was built by Inigo Jones, in a style intended to represent the perpendicular style of Gothic architecture, consecrated in the time of James I., 1623. The body of the chapel is elevated about 10 ft., on six groined arches or vaulting, open to the square space without; and the entrance to the chapel is up a flight of stone stairs, and adjacently to chambers on the head of the stairs, and in a cluster of buildings, forming an adjoining portion of the Old Hall or the High Court of Chancery. The interior of the chapel is a capacious room, very elevated, and sufficiently large to hold conveniently as many persons as there are members of the House of Commons. The form is efficient for hearing in any part, by the simplicity and plainness of its adornment, not an inappropriate example for the legislative house. The ceiling is slightly vaulted, and is represented in the engraving, page 176.

The windows represent the twelve apostles, and the coats-of-arms of the members, painted on glass by Bernard Van Linge; on the north side are Moses



LINCOLN'S INN HALL.

and the Prophets, St. John the Baptist and St. Paul; on the latter is recorded that it was executed at the expense of William Noy, attorney-general of Charles I. On the large east window, are the numerous coats-of-arms, well executed, of the past treasurers of the society, from the earliest period of the opening of the chapel to the present time; among them are the names of many renowned for learning. As preachers in this chapel are the great ecclesiastics, Drs. Donne, Usher, Tillotson, Warburton, Langhorne, Heber, Lonsdale, and the present Mr. Anderson. The service is well performed, assisted by choir-singers.

Gray's Inn, an Inn of Court, the fourth in importance, is attached to Staple and Barnard's Inns, both situated in Holborn, in the city, and south side of the street; its origin, 1505, from the Lords Gray, of Wilton, whose residence was on the site; it passed into the hands of Hugh Denny, and then into the possession of the prior and convent of East Sheen, in Surrey, by whom it was leased to certain of the law; at the time of Henry VIII., it became the property of the crown. The hall was built in 1560, and the gardens first planted in 1600, when Francis Bacon, afterwards Lord Bacon, was treasurer, and the Inn divided into four courts, South Square, Field Court, Chapel Court, and Gray's Inn Square, the hall and chapel separating the latter from South Square; and recently, a row of houses for chambers are attached, called Verulam Buildings. This Inn of Court, like the others, can boast of very eminent men, among whom are Lord Bacon, Lord Burleigh, &c. Romilly was a member of Gray's Inn, and it is now a court of considerable influence in the promotion of students to the bar. The chambers are principally occupied by barristers and students, and solicitors of good and respectable practice.

Of the general denomination, the Inns of Chancery, are those of Thavies Inn, principally occupied by private individuals; Clement's Inn, Clifford's Inn, Staple Inn, Lyons' Inn, Furnival's Inn, principally occupied by professional men, Barnard's Inn, also Symond's Inn, and other Inns. That of Serjeants' Inn, Fleet Street, inhabited by private and professional persons, and of Serjeants' Inn, Chancery Lane, by serjeants-at-law, barristers, and the chambers of the Judges.

JEWS—SYNAGOGUES AND SCHOOLS.

Settlement of the Jews in England.—There appears to have been two distinct divisions of *these* people in this country; the history of the one terminating with their banishment by Edward I., and that of the second commencing with the visit of Rabbi Menasseh Ben Israel to England in A.D. 1655. We have evidence of their residing in England in 750, from the canons of Ecbright, Archbishop of York, issued in that year, which contain an injunction that "no one should *judaize* or eat with a Jew," and also from the History of Croyland Abbey.

Under Edward the Confessor they were regarded as subjects to the immediate authority, and claimants upon the special protection, of the King.

William the Conqueror, encouraged them to come and settle in the land of his conquest, and it is generally supposed, some town was allotted to them for residence, the name of which has been lost in the lapse of time.

Numbers of Jews resided at Oxford A.D. 1076 (*vide* Wood's "History of Oxford"); shortly afterwards they possessed most of the houses in St. Edward's and Aldgate parishes; which from this circumstance were called "great and little Jewries." Some of their houses at Oxford were also called "Halls," on account of scholars resorting thither for instruction, and were known by the name of Mosey's Hall, Jacob's Hall, and Lumbard's Hall.

Here was the first Synagogue upon record, but there was in London very shortly after this date, the Jewries extending along both sides of what is now called Gresham Street to Basinghall Street, and Old Jewry on the east. The Synagogue is said to have stood at the north-west corner of Old Jewry.

They enjoyed considerable favour under the first three Norman Kings, during which period, doubtless, they laid the foundation of their subsequent wealth.

The only place appointed to them in England to bury their dead was in Red Cross Street. This remained to them till the year 1177, the 24th of Henry II. The present Jewin Street, Aldersgate Street, was also allowed to them for the same purpose.

During the former part of the reign of King John, they seem to have gained the favour of that monarch, and obtained permission to appoint a

High Priest of England, which appointment was confirmed by Royal Charter.

But subsequently they suffered much persecution, and were eventually banished from this country in 1291. They continued in exile for 357 years, after which Rabbi Menasseh Ben Israel, a Jewish Rabbi of great learning in Amsterdam, addressed a petition to the Protector Cromwell on behalf of his brethren, and offered, in return for the privileges, 50,000*l*., provided the Bodleian Library, at Oxford, was made over to them, and they were permitted to take possession of St. Paul's Cathedral as a Synagogue. Parliament, however, demanded 80,000*l*., and the negotiations were broken off. During the interval Jews lived *secretly* in England, but *did not* possess any "Jewries" or publicly organized congregation. Ultimately they obtained permission to return: though the Commonwealth refused to give any *formal* sanction to their return, they tacitly assented; and most of the settlers being Portuguese Jews, the first Synagogue was erected by the Portuguese Jews in King Street, Duke's Place, in 1656; a school was founded by them also in 1664 called "the Tree of Life."

The first German Synagogue, also in Duke's Place, was built in 1691, and occupied until 1790, when the present edifice was erected.

The Distinctive Ceremonies of the Portuguese and German Jews.—The Spanish and Portuguese Congregation of Jews, who are also called Sephardim (from the word Sepharad, which signifies *Spain* in Hebrew) are distinct from the German and Polish Jews in their ritual service. The prayers both daily and for the Sabbath materially differ from each other, and the Festival prayers differ still more. Hence the Portuguese Jews have a distinct Prayer Book, and the German Jews likewise. The fundamental laws are equally observed by both sects, but in the ceremonial worship there exists numerous differences. The Portuguese Jews eat some food during the Passover, which the German Jews are prohibited by some Rabbies, whose authority is not acknowledged by the Portuguese Rabbies. Nor are the present ecclesiastical authorities in London of the two sects the same. The Portuguese Jews have their own Rabbies, and the German have their own. The chief Rabbi of the German Jews, which are much more numerous than the Portuguese, is the Rev. Dr. Nathan Marcus Adler, late chief Rabbi of Hanover, who wears no beard, and dresses in the German costume. The presiding Rabbi of the Portuguese Jews is the Rev. David Meldola, a native of Leghorn; his father filled the same office in London. Each chief Rabbi is supported by three other Rabbies, called Dayamin, which signifies in Hebrew "Judges." Every Monday and Thursday the chief Rabbi of the German Jews, Dr. Adler, supported by his three colleagues, sits for two hours in the Rabbinical College (Beth Hamedrash), Smith's Buildings, Leadenhall Street, to attend to all applications from the German Jews, which may be brought before him, and they decide according to the Jewish law. Many disputes between Jews in religious matters are settled in this manner; and if the Lord Mayor or any other magistrate is told that the matter has already been decided by the Jewish Rabbi, he seldom interferes. This applies only to civil, but not to criminal cases. The Portuguese Jews have their own hospital, and their own schools (*vide* under the head of "Hospitals" and "Schools" respectively). Both congregations have their representatives in the Board of Deputies of British Jews, which board is acknowledged by Government, and its triennial. Sir Moses

Montefiore, a Jew of great wealth, and who distinguished himself by his mission to Damascus, during the persecution of the Jews in that place, and also by his mission to Russia, some years ago, is the President of the Board. All political matters calling for communications with Government, are within the province of that useful board.

Their Wealth and Population.—Although the Rev. Dr. Adler did a few years ago, issue a circular inviting statistical communications, the amount of the Jewish population in England, or in London, could not be ascertained with any degree of certainty. It is calculated that the number of Jews in England, foreigners included (the number of whom increases greatly every year), is about 35,000, and the number of Jews in London about 18,000. Within late years a large number of foreign Jews who hawked about in the country, and who are known by the name of "travellers," have emigrated to America. Many wealthy foreigners have lately gone to California. The greatest number of the Jews in London live in the city. It is calculated that no less than 12,000 Jews reside in the city. The wealthy Jews, as well as Christians, who have their counting-houses, warehouses, and offices in the city, have all removed their private residences to the West End of the town within late years. The mansions of the Rothschild family, and of Sir Isaac Goldsmid, are considered most noble and elegant. That of Sir Moses Montefiore, at Ramsgate, is a magnificent seat, and the grounds are very extensive. The present Queen, when Princess Victoria, used frequently to borrow the keys from her neighbour, Sir Moses Montefiore, to take a walk with the Duchess of Kent, round the beautiful space of ground attached to Sir Moses's mansion, called East-Cliff Lodge. Sir Isaac Goldsmid's town residence, called St. John's Lodge, Regent's Park, is also a magnificent mansion; and Gunnersbury Park, the seat of Baron Lionel de Rothschild, M.P., is also celebrated for its splendour. Sir M. Montefiore also built and supports a beautiful synagogue at his seat in Ramsgate.

The wealth of the Jews in England, and particularly in London, is very great. At the Stock Exchange the Jews exercise an overwhelming influence; and hence the slackness of business at that Exchange on Sabbath and Festivals, when the Jews do not, or very few of them, attend. One of the richest individuals after the Rothschilds, is Sir Isaac Goldsmid, who has had also the title of Baron de Goldsmid and da Palmeira conferred upon him by the Queen of Portugal. His property in that country is considered to yield about 35,000*l.* a year. There is also S. M. Samuel, Denis M. Samuel, Benjamen Cohen, Alderman Salomons, P. J. Salomons, Moses Mocatta, &c., all possessed of immense wealth. Two brothers, named Lewis and Nathaniel Levy, the contractors for the turnpikes in England, are also very wealthy. The greatest shipping houses are the Salomons', in Old Change, Cheapside, Messrs. Moses, Son, and Davis, Aldgate, and the Moses', Tower Hill. The great Clothing Establishments of Moses and Son, Minories and Aldgate, and that lately established in New Oxford Street, as well as those of the Messrs. Hyams, in Gracechurch Street, and Oxford Street, are most elegant and superb establishments. The amount of property turned round every year in those establishments is calculated at many millions sterling.

Some idea of the immense extent of Messrs. Moses and Son's premises may be formed, when we state the fact that the city establishment consists of no less than seven large houses, (independent of the waiting hall), each house being divided into various classified compartments, as required in the different branches of the business.

The Branch Establishment at the West End consist of six houses of an equally magnificent description; and both at the city and at the Oxford Street establishments there are communications from one shop to another as well as from one show-room to another, which arrangement renders each warehouse one vast undivided establishment.

With reference to the capital here employed we are not in a position to furnish anything like an accurate statistic, but no mean amount could suffice to keep in operation so gigantic an undertaking. It would be interesting to know how many operatives, in various branches of trades, form the work-people of the Messrs. Moses and Son's establishments, apart from the other several branch houses in Bradford and Sheffield; THOUSANDS are, however, employed by these gentlemen.

The extent of the business carried on may be judged of from an inspection of the immense stock of wholesale and retail goods, clothing, hats, boots and shoes, outfits, hosiery, furs, and other articles. The extent and elegance of the warehouses, externally and internally, are, perhaps without equal in the world.

The Messrs. Hyam have two large clothing establishments in London, besides others in all the large provincial towns.

Their houses in Gracechurch Street and Oxford Street are fitted up in a splendid style, and are very extensive, embracing all the varied departments of gentlemen's wearing apparel.

Their business is conducted on a liberal scale, and great credit is due to them for the improvements they were the first to originate in the ready-made clothing trade. Their purchases, as may be supposed, are very extensive, and buying (as we are informed they do) for cash, the amount of capital they turn in the course of a year must be enormous.

Some of the highest families in the kingdom are supplied by the Messrs. Hyam's establishment.

The number of hands employed by this enterprising firm amounts to upwards of 6000, and the yearly average sum paid for wages exceeds 200,000*l*.

Both the Messrs. Moses and Hyam shut up their establishments on Friday evenings at dusk, and the whole of Saturday, as well as during 13 Festival days of the year, viz.—Four days of Passover; four days of Tabernacles; two days of New Year; two days of Pentecost; one day of Atonement; which is no mean sacrifice for the cause of religion.

The Messrs. Rothschild have seven houses in Europe, viz.—In London, Frankfort, Vienna, Naples, Paris, Amsterdam, and Madrid.

The amount of capital possessed by these firms is supposed to be upwards of twenty-five millions sterling; the richest of the family is the Baron Anselm de Rothschild, of Frankfort, who alone possesses seven millions sterling.

Another remarkable establishment is that of Mr. Nathan Defries, the eminent gas-fitter. Mr. Defries has invented the dry gas-metre, by which gas is measured without the agent of water. This invention has proved eminently successful. Since the invention, he has sold nearly 40,000 of the dry gas-metres, among which is the enormous metre intended for the New Houses of Parliament, calculated to pass 10,000 feet of gas per hour, and pronounced by most of the scientific men of the day, as also by the press, to be the most complete measuring machine ever constructed. Mr. Defries has since invented several modes of cooking and heating, also for warming and ventilating buildings by gas. He has also constructed a bath, by which forty-five gallons of from 50 to 95 degrees can be heated by the aid of gas in four minutes at the cost of 2*d.*; and he is now employed in very important experiments relative to heat and light which will be of great benefit to the public.

Mr. Nathan Defries has three establishments; one in St. Martin's Lane, one in Regent Street, and another in the Hampstead Road.

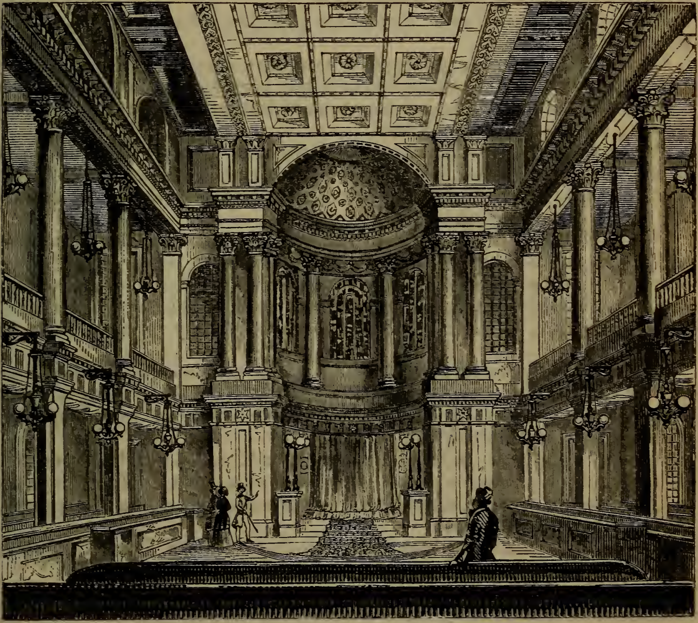
There is, however, a great deal of poverty among the Jews in the city, as in Middlesex Street, commonly called Petticoat Lane, and in Whitechapel, although the charity distributed annually is very great, and it is calculated that the Rothschild family alone distribute annually near 10,000*l.* in charitable gifts.

Their Synagogues. There are several Synagogues in the city belonging to the German and to the Portuguese Jews.

The Great Synagogue, Duke's Place, St. James's, Aldgate, is the largest.

The New Synagogue, Great St. Helen's, Bishopsgate, a very elegant and ornamental structure, as seen below, erected from the designs of Mr. John Davies, of Great St. Helens. The lower order, as will be seen, is of the Doric, in pilasters, painted in imitation of verde antique, on a porphyry ground; the upper, Corinthian, in pillars and pilasters, in imitation of Sienna marble, with three windows in the inter-columns, of a rich arabesque pattern, in stained glass. The ceiling is semi-dome, with octagonal coffers containing gilded flowers on an azure ground; and the pavement, which is of polished marble, forms an entire circle, &c.

The Hambro' Synagogue, Fenchurch Street, small and neat.



THE NEW SYNAGOGUE, GREAT ST. HELEN'S

The Portuguese Synagogue, Bevis Marks, St. Mary Axe.

There are two minor Synagogues in Gun Yard, and Cutler Street, Houndsditch, called the Polish Synagogues.

There are three synagogues at the west end of London.

The Western Synagogue, St. Alban's Place, Haymarket, is the largest.

The Maiden Lane Synagogue, Covent Garden.

The West London Synagogue of British Jews, or Reform Synagogue, Margaret Street, Cavendish Square. To this Synagogue belong Portuguese and German Jews, and is the wealthiest of all. It has only been established 8 years. They have curtailed the service, abridged the ritual, and observe only one day of the Festival, whilst the orthodox Jews observe two. The members of that Synagogue are excommunicated by a declaration of the late chief Rabbi; but this is only a matter of form, as they have lately partaken of every rite to which the orthodox Jews are entitled.

Their Schools.—There are four Jewish schools in the city and three at the West End. In the city are—

1. The Jews' Free School, Bell Lane, Spitalfields, about 1200 boys and girls.
2. The Infant School, Houndsditch, about 400 infants.
3. Orphan Asylum School, Tenter Ground, Goodman's Fields.
4. The schools attached to the Sephardim Synagogue, Bevis Marks.

At the West End—

The Western Jewish School for boys, 59 A, Greek Street, Soho.

Ditto for girls, 20, Dean Street, Soho.

West Metropolitan Jewish School for girls, Little Queen Street, and for boys, in High Holborn.

All these schools are supported by voluntary contributions.

Sir Anthony de Rothschild, Bart., is the president of the Jews' Free School, Bell Lane; and the late Baroness de Rothschild provided annually clothing for all the 1200 children.

Public Institutions.—The Jews' and General Literary and Scientific Institution, Sussex Hall, Leadenhall Street, chiefly supported by Jews; where concerts and lectures take place, contains also a circulating labrary and large reading rooms.

The Rabbinical College, or Beth Hamedrash, Smith Buildings, Leadenhall Street, contains one of the most splendid Jewish Libraries in Europe, collected by three generations previous to the life of the late Dr. Herschell, Chief Rabbi of England, and is open to the public by tickets, to be had of the Rev. Dr. Adler, the Chief Rabbi, Crosby Square, Great St. Helens.

Lectures are delivered GRATUITOUSLY to the public every Friday evening by some of the most learned Jews in the Kingdom, among whom is Mr. M. H. Bresslau, of 18, Mansell Street, Professor of Languages, Mr. J. L. Levison, of Brighton, &c.

The Jews' Hospital, Mile End, a large building in which decayed old men as well as children of both sexes find an asylum. Many boys are taught a trade, such as shoemakers, carpenters, turners, &c. Supported by voluntary contributions.

The Hand in Hand Asylum for decayed age, Duke's Place, St. James, Aldgate.

The Widows' Home, for poor widows, Duke Street, Aldgate.

Alms Houses erected by Sir Moses Montefiore, Jewry Street, Aldgate.

Almshouses erected by A. L. Moses, Esq., situated at Mile-end.

Almshouses, erected by Joel Emanuel, Esq., situate at Wellclose Square, East Smithfield.

The Orphan Asylum, Tenter Ground, Goodman's Fields, with a school attached. It was built by A. L. Moses, Esq., and is supported by voluntary contributions. It contains 22 inmates, 14 girls and 8 boys.

Jews are now admissible to all public offices and dignities, except to a seat in Parliament. It is anticipated, however, in this enlightened age, that a people so loyal and so industrious will, before another session passes over, sit by the side of the Christian in the legislative councils of the nation.

In London, Sir Moses Montefiore and Mr. David Salomons have filled the office of high sheriff. Baron Meyer Rothschild and Sir Isaac Lyon Goldsmid have also filled the same office. Sir Moses Montefiore, Benjamin Cohen, Esq., and others, have also filled the office of magistrate. Benjamin S. Phillips is now common councilman, and Mr. David Salomons alderman, in the city of London. Mr. David Barnett has filled the office of town councillor in Birmingham, Mr. Emanuel in Portsmouth and Mr. Alexander the same office in Bristol for many years. Mr. Alexander is now alderman in Bristol ; and there are several Jewish poor-law guardians. Indeed, the feeling of Christians towards Jews has in late years become very liberal in this country. Christians subscribe to Jewish charities, and Jews are very munificent supporters of all Christian charities.

THE LEARNED SOCIETIES, MUSEUMS, AND PUBLIC LIBRARIES.

I. CHARTERED SOCIETIES, INCLUDING MUSEUMS ESTABLISHED BY ACTS OF PARLIAMENT.

THE ROYAL SOCIETY OF LONDON, SOMERSET HOUSE.

Date of Charter, 1662.

The learned societies of London are numerous and important, and their influence is diffused imperceptibly, yet certainly throughout the land. There is no portion of the empire which can be properly said to be unconcerned in the proceedings of bodies of men, who, in their constant search after truth, and diligent investigation of the laws of nature, are continually advancing our knowledge and our resources, and contributing to our comfort and welfare, in the numberless details of every-day life. A higher office is also theirs, namely, that of dissipating prejudice and ignorance, and opposing a mass of sound knowledge, and of careful theory, to the erroneous and rashly-formed opinions of the vulgar. The association of learned men for such objects was begun in other countries before it reached our own ; and some of the rules which regulated the ancient *Academia dei Lyncei* at Rome, of which Galileo was a member, are still the guiding rules of all similar associations. The members of that eminent society were exhorted to pass over in silence all political controversies, and quarrels of every kind, and wordy disputes, which give occasion to deceit, unfriendliness, and hatred, and to seek after peace, and freedom from molestation in their studies. They were required to be eager in their pursuit of real knowledge, in their study of nature and mathematics, and at the same time not to neglect "the ornaments of elegant literature and philosophy, which, like a graceful garment, adorn the whole body of science." They were exhorted "in the pious love of wisdom, and the praise of the most good and most high God," to give their minds first to observation and reflection, and afterwards to writing and publishing. Their meetings were not to be for recitation and declamation, but for transacting necessary business; and they were especially warned to "let the first fruits of wisdom be love," and to be so united to each other by strict ties that no interruption should occur in this sincere bond of faith and love, emanating from the source of virtue and philosophy. The spirit which regulated this academy, during its brief existence of 23 years, is that which forms the strength of our own learned societies, and without which none can long or honourably pursue its course. This Italian Academy, which was only one out of many in that country, was founded by the Marchese Frederico Cesi in 1609, and expired at the death of its founder in 1632. The French established, in 1635, the *Academie Française*, chiefly for the improvement of the national language; but to England belongs the honour of being the first, next to Italy, to establish a society for the prosecution of experimental philosophy. This took place about the year 1645, when several learned men in London, taking no part in the political agitations of the time, agreed to meet together once a week to discourse on mathematical and philosophical subjects. A few years later, when two or three of these individuals were appointed to offices in the University of Oxford, they gathered around them a similar party in that city. Thus in two places there arose the germs of that noble and valuable institution, the Royal Society.

"The men that formed the Royal Society," says Bishop Burnet, "were Sir Robert Moray, Lord Brouncker, a profound mathematician, and Dr. Ward. Ward was a man of deep search, went deep into mathematical studies, and was a very dexterous man, if not too dexterous, for his sincerity was much questioned. Many physicians and other ingenious men went into the society for natural philosophy. But he who laboured most, at the greatest charge, and with the most success at experiments, was the Hon. Robert Boyle. He was a very devout Christian, humble, and modest almost to a fault, of a most spotless and exemplary life in all respects."

It was not till after the Restoration in 1660 that the members of this body formed themselves into a regular society, and framed a set of rules for their mutual guidance. These were confirmed by Royal Charter in 1662, and the infant society was looked upon with interest and favour by the king, as well as cordially welcomed by the scientific world in general. The meetings were at this time held at Gresham College, in Bishopsgate Street, and continued to be carried on there with great success, until the plague broke out and dispersed the assembly; and subsequently, the great fire destroyed so much of the city that the authorities were obliged to take possession of the rooms the society had hitherto occupied. Apartments were then offered for their temporary use in Arundel House, and these were gladly accepted and entered upon. At the same time Mr. Howard presented them with a valuable library, consisting of several thousand printed volumes, and numerous manuscripts which had been purchased by his grandfather, Thomas, Earl of Arundel, during his embassy at Vienna.

At this time (1667) the number of members amounted to 200, and their rate of subscription was 1*s.* per week each. But many of them were unable to pay even this small sum, so that frequent meetings and deliberations were held as to the state of the society's funds. It is painful to read that among the members excused from payment, on account of the state of their finances, was Mr. Isaac Newton, whose investigations had already began to enlighten the world, through the medium of this society. "The generosity of the council," says Mr. Weld (the present assistant secretary and historian to the society), "was not without its reward, as 'the poor Cambridge student,' grateful for the consideration shown him, was, probably, incited to labour more zealously for science, and for the Royal Society, to whom he communicated all his noble discoveries. The great philosopher, praying to be excused from the payment of 1*s.* per week, contrasts curiously with his subsequent wealth."* Newton had been proposed for election as a Fellow of the Royal Society, on Dec. 21, 1671, by the Bishop of Sarum (Seth Ward), on which occasion he modestly wrote, "I am very sensible of the honour done to me, by the Bishop of Sarum, in proposing me a candidate, and which I hope will be further conferred upon me by my election into the society; and if so, I shall endeavour to testify my gratitude by communicating what my poor and solitary endeavours can effect towards the promoting their philosophical designs." He was elected on the 11th of January following, when he was 29 years of age. The existence of the *Philosophical Transactions*, in which the proceedings and discoveries of the society are registered, dates from March 6, 1664–5.

Various efforts were made by the society to found a college of their own, in furtherance of which their benefactor, Mr. Howard, gave them a piece of ground near Arundel House, and a design for the building. Sir Christopher Wren and Mr. Hooke also sent plans. The latter was curator of the institution, with a salary of 80*l.* per annum. But neither of the designs was acted upon, nor was advantage taken of another scheme, that of obtaining the grant of Chelsea College for the purposes of the society. In the first case the want of funds appears to have been the obstacle; in the second, the inconvenient distance from town, and the dilapidated state of the building. Under these circumstances the proposals of the Mercers' Company that the society should return to Gresham College, called also the Royal Exchange, was willingly acceded to. The grant of Chelsea College was, however, the means of improving the society's funds; for, when found to be unfit for their purpose, it was purchased back for the king's use for 1300*l.*, which sum, together with pecuniary help from other quarters, enabled the council to purchase an annual income, and to establish their affairs on a more secure basis.

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* Flamsteed, in his private journal, states that "Newton was obliged to read [*i. e.* teach] mathematics for a salary at Cambridge."

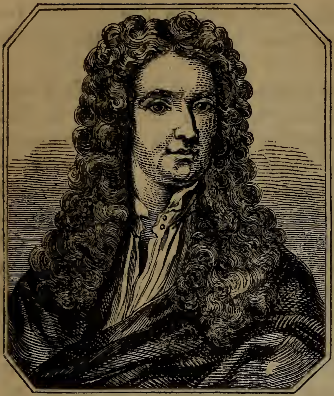
From this time their progress was rapid and successful, the different committees working in their several departments. Their activity had been shown several years before by the division of labour agreed upon between them, which was as follows:—1. Mechanical, to consider and improve all mechanical inventions. 2. Astronomical and optical. 3. Anatomical. 4. Chemical. 5. Georgical. 6. For histories of trade. 7. For collecting all the phenomena of nature hitherto observed, and all experiments made and recorded. 8. For correspondence.

It was naturally to be expected that in the infancy of experimental science, much that was trivial as well as much that was important, should be brought before the society. The members were not yet in a condition to estimate rightly either the one or the other. On the one hand, being fearful of rejecting what might lead to some discovery, they countenanced investigations and witnessed experiments which, in the broader light of science, appear perfectly ridiculous; on the other hand, being doubtful as to the most important theories and discoveries, they were not fully alive to the grand advances they were making by means of the indefatigable Newton, though they always upheld and honoured him to the best of their power. The first communication of his appeared in the 80th number of the *Philosophical Transactions*, containing his discoveries on the nature of light, refractions, and colours. These were assailed by various individuals, but were incapable of being shaken. The experiments had all been made in 1666, when he was only 23 years of age, and were now first brought to light in 1672.

The real advance of the society was not so apparent to the world in general as the weaker points to which we have alluded. These were readily seized, and converted into weapons of attack. A Warwick physician (Stubbe) and a Somersetshire clergyman (Crosse) had fiercely accused the society of an attempt to undermine the universities, to bring in popery, and to introduce absurd novelties; and at a later period Sir John Hill actually devoted a quarto volume to the attempt to pour contempt and ridicule on this illustrious body. Attacks of this nature, together with straitened means, were some impediment, but no real evil, to the society, for they induced greater care as to what was submitted to the public eye.

It was on April 28, 1686, that the manuscript of Newton's *Principia* was placed in the hands of the society, being dedicated to that body. Halley, the astronomer, was at that time clerk or amanuensis to the society, and thus acknowledged their feelings on the matter:—"Sir,—Your incomparable treatise, intituled *Philosophiæ Naturalis Principia Mathematica*, was, by Dr. Vincent, presented to the Royal Society on the 28th instant; and they were so very sensible of the great honour you have done them by your dedication, that they immediately ordered you their most hearty thanks, and that the council should be summoned to consider about printing thereof. But by reason of the president's attendance upon the king, and the absence of our vice-president, whom the good weather hath drawn out of town, there has not since been any authentic council to resolve what to do in the matter; so that on Wednesday last the society, in their meeting, judging that so excellent a work ought not to have its publication longer delayed, resolved to print it at their own charge, in a large quarto, of a fair letter, and that this their resolution should be signified to you, and your opinion thereon be desired, so that it might be gone about with all speed." Notwithstanding this generous intention, the society appears to have been too much embarassed at the time to print the book, and the disinterested Halley took it upon himself. Thus the council subsequently ordered that "Mr. Newton's book be printed, and that Mr. Halley undertake the business of looking after it, and printing it at his own charge, which he has engaged to do." The *Principia* was published about the middle of 1687, with some Latin hexameters prefixed in praise of the illustrious author, from the pen of his noble-minded friend, Halley. The price of a copy of the first edition did not exceed 12*s*. The manuscript of this immortal work, entirely in Newton's own hand, is considered the greatest treasure of the Royal Society. Newton's reputation was fully established by the publication of this volume, and from that time honours and riches began to pour in upon him. In the following year he was returned to Parliament as one of the representatives of his university. In 1695 he was appointed Warden, and in 1699 Master of the Mint, and in the latter year he was also elected a foreign member of the French Academy. In 1703 he became President of the Royal Society, and was annually re-elected during the remaining 25 years of his life.

In 1705 he was knighted by Queen Anne, who always treated him with marked esteem, and on the accession of George I. he was still honoured and respected at court, and admitted to the personal friendship of the Princess of Wales, who was also a correspondent of Leibnitz. From the period of his being elected president, up to a few weeks before his death, he presided at almost every meeting of



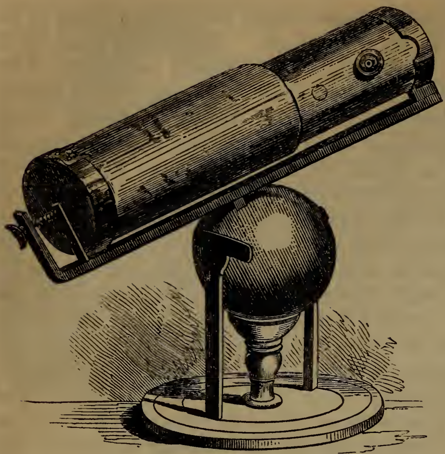
SIR ISAAC NEWTON.

the fellows of the Royal Society. In the year of his election he presented his treatise on Optics to the society; this was first published in English, and then so ably translated into Latin by Dr. Clarke, that Newton presented him with 500*l.* on the occasion. In the following year occurred his unhappy quarrel with Flamsteed, the astronomer-royal, who had been established at the Observatory at Greenwich ever since the erection of that building in 1675, and was about to publish his observations, being encouraged thereto by Prince George of Denmark, a fellow of the Royal Society. These observations were submitted to a committee of the Royal Society, and warmly approved; but their publication was long delayed by the misunderstanding between their author and the president, and when they did at length appear, they were published in a form so little to Flamsteed's taste that he collected all the copies he could and burnt them, printing, at his own cost, another and more correct transcript of his observations. This quarrel is spoken of by Weld as "a melancholy instance that even giants in intellect are not free from the failings of their less gifted brethren." In the same year the society opened a communication with a small philosophical association at Edinburgh, as it had previously done with one in Dublin. In 1709 the society lost one of its oldest fellows, Sir Godfrey Copley, whose name is generally known by the Copley medal, awarded to the authors of brilliant discoveries, and originating in a bequest of 100*l.*, for the advancement of natural science.

The society had received various intimations from the Mercers' Company that they were not long to remain in possession of Gresham College, and it was under the presidency of Sir Isaac Newton that a change was effected, and that they became at last located in a house of their own. This was not done without opposition in some quarters, and the failure of repeated attempts to obtain from the queen a grant of ground at Westminster, or from the trustees of the Cotton Library leave to meet in their apartments; Burnet relates that "Lord Halifax moved the House of Lords to petition the queen that the Cotton Library and the Queen's Library should be joined, and that the Royal Society, who had a very good library at Gresham College, would remove and hold their meetings there as soon as it was made convenient for them." But upon the failure of all these attempts the society at length purchased a house in Crane Court, which, as their president informed them, was to be sold, "and being in the middle of the town, and out of noise, might be a proper place to be purchased by the society for their meetings." Here they held their first meeting on the 8th of November, 1710, and soon after their library and museum were established there likewise. For a period of seventy-two years they occupied this house, gathering fresh renown, and widely extending their reputation. In the month following their removal to Crane Court, the society gained fresh importance by being appointed by the Queen visitors and directors of the Observatory at Greenwich; but this appointment caused Flamsteed the keenest vexation. His dislike to Newton had increased with his infirmities, so that he wrote with great bitterness and injustice—" Sir Isaac Newton still continues his designs upon me, under pretence of taking care of the Observatory, and hinders me all he can; but, I thank God for it, hitherto without success."

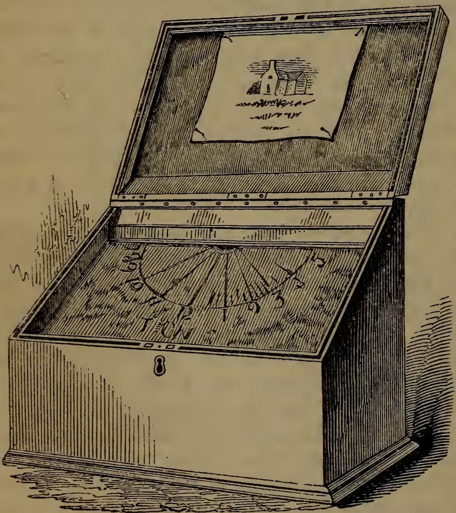
By favour of Queen Anne, who greatly countenanced and encouraged the society, instructions were prepared for ministers and governors going abroad, who were enjoined to promote the interests of the society in foreign lands; and on the decease of one of the fellows, Robert Keck, Esq., in 1719, a bequest of 500*l.* was expressly assigned for the purpose of carrying on foreign correspondence by means of a paid officer. Other bequests about this time increased the property of the society, which was now so considerable, that the council, in 1724, memorialized George I. for a licence to purchase and hold lands, &c., in mortmain. The king referred the matter to the solicitor general, whose opinion being favourable, the licence was granted. In the year following the society, at their own expense, sent barometers and thermometers, to the number of eighteen, to several of their correspondents abroad, who were willing to assist them by making observations. In this way a great impulse was given to the study of meteorology.

But the society was now called to bear the loss of its brightest ornament. On the 20th of March, 1726-7, Sir Isaac Newton died, at the advanced age of eighty-five. According to Hearne, he had promised to be a benefactor to the Royal Society, and he had ample means of doing so, for his personal estate was worth 32,000*l.*, but he left no other legacy to the society than his own fame, which far surpasses all pecuniary wealth. Among the relics of this great philosopher, still in the keeping of the Royal Society, are the first perfect reflecting telescope ever invented, which bears on its stand the following inscription, THE FIRST REFLECTING TELLESCOPE INVENTED BI S^{R} ISAAC NEWTON, AND MADE WITH HIS OWN HANDS IN THE YEAR 1671. Also, one of the solar dials made by him when a boy. This dial was taken down from the south wall of the Manor House at Woolsthorpe in 1844, and presented to the society by the Rev. Charles Turnor, F.R.S. The name of NEWTON, with the exception of the first two letters, which have been obliterated by time, appears to have been inscribed upon the dial in rude capital letters.



NEWTON'S REFLECTING TELESCOPE.

The gnomon of this dial has been lost. The dial is preserved in a strong oaken box, with a plate-glass cover, and on the under surface of the lid is a sketch of the house, showing the position of the dial*. The society is also in possession of three portraits of Newton in oil, one painted by Jervas, another by Marchand, and the third by Vanderbank. Likewise the original mask of Sir Isaac's face, from the cast taken after death, which belonged to Roubilliac. Also a lock of silver-white hair of the philosopher, which is now inclosed in a small mahogany box with a glass cover.



NEWTON'S SOLAR DIAL.

The Royal Society is in possession of a most interesting volume, in which the autographs of Newton, and all the other presidents, are entered. This is the charter book, richly bound in crimson velvet, with gold clasps and corners, having on one side a gold plate bearing the shield of the society, on the other a corresponding plate, showing the crest. The leaves of this book are of the finest vellum, and the first two pages are adorned with the arms of England, and those of the society, superbly emblazoned. Then follow the second and third charters and the statutes, extending over sixty-six pages. Eleven blank leaves then intervene, after which the autograph portion commences with the signatures, *Charles R.*, *Founder; James*, *Fellow;* and *George Rupert*, *Fellow*, inclosed within an ornamented scroll border, with the royal shield. The next page contains the signatures of various foreign ambassadors, and the succeeding ones those of the fellows, among which the eye is arrested by names glorious to our country, and illustrious throughout the world. This charter book is of continually-increasing value; for here are entered, as years pass on, the names of all the distinguished persons of our own, and many of foreign countries. The autographs of the kings and queens of England, as well as those of many other nations, have here been duly entered, and our present Queen has signed her name on a richly-illuminated page, which also contains the signatures of Prince Albert, and the Kings of Prussia and Saxony.

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* The accompanying engravings of these two interesting relics were made from sketches taken from the objects themselves, by permission of the council of the Royal Society.

Sir Isaac Newton was succeeded by Sir Hans Sloane, a physician, and a most diligent naturalist, whose splendid collections afterwards formed the nucleus of the British Museum. Sir Hans Sloane obtained the favourable regard of the King (George II.), and of his Queen, to the society: he was also the means of introducing the practice of inoculation, the Queen taking courage from his opinion to try it on her own children. By order of government the society took the oversight of new inventions, which were exhibited before them and registered previous to being patented. The society was now continually receiving specimens or valuable information from various other bodies with whom it held friendly correspondence. It had been the desire of Sir Isaac Newton to encourage the formation of scientific societies in the provinces. His successor trod in his steps, and we find that archæology, as well as science, was warmly encouraged. In 1734 valuable collections of plants, animals, and minerals were received from America, while the Apothecaries' Company at Chelsea sent annual contributions of dried plants.

With all these attractions the meetings were well attended; but the members were again sadly in arrear with their subscriptions, no less a sum than 1844*l.* 16*s.* being due. Great exertions were made by the council, and at last they succeeded in restoring the society to a state of prosperity. In 1741 Sir Hans Sloane resigned his office on account of ill health, and was succeeded by Martin Folkes. But it is not our purpose to give a list of the presidents generally. Great improvement was effected in chronometers under the encouragement of this society; the subject of ventilation, especially in prisons, began to attract their enlightened study, while, at the same time, Bradley, who had succeeded Halley and Flamsteed at the Royal Observatory, was making important additions to astronomical science, in acknowledgment of which the Copley medal was awarded to him. In 1757 it was awarded to Lord Charles Cavendish for an improved form of thermometer, and in 1758 to Dolland, the discoverer of achromatic lenses. The transit of Venus, which Halley had foretold for 1761, caused the society to take active measures in sending out observers to St. Helena and the Cape of Good Hope, and during these interesting proceedings George III. ascended the throne. The observations were not, however, satisfactory, and astronomers looked with anxiety for the next occasion, in 1769, for taking them with greater accuracy. The King entered warmly into the subject, and ordered 4000*l.* to be placed at their disposal. Lieutenant Cook and Mr. Green were sent to the Pacific, Messrs. Dymond and Wales to Hudson's Bay, and Mr. Call to Madras. Mr. (afterwards Sir Joseph) Banks, a gentleman of large fortune, asked leave to accompany Cook, and took with him Dr. Solander, a Swedish botanist, two draughtsmen, and four servants. The observations on this occasion were much more successful than in 1761. Soon afterwards the society took up the subject of Arctic voyages of discovery, which were also warmly encouraged by the King.

Amidst all this activity, there was also unfortunately a subject of discord. It will scarcely be believed that this respected the relative properties of knobbed and pointed lightning-conductors. An application was made on the part of government for information from the Royal Society, as to the best form of lightning-conductor for the protection of a powder-magazine at Purfleet. A committee was appointed to consider the matter, consisting of Cavendish, Watson, Franklin, Robertson, and Wilson. The first four recommended pointed conductors; the last-named persisted in recommending the blunt form of conductor. This apparently trivial circumstance afterwards led to a serious quarrel in the society, which lasted three years; for, unfortunately, after the pointed conductors were erected, the Purfleet magazine received some slight damage from lightning. A second government application now led to a second meeting of the most eminent electricians, who a second time decided against Mr. Wilson. His theory had in the meantime become mixed up with party politics, so that the populace, and even a portion of the upper classes, took up his quarrel, and considered that those who opposed him were biassed by Franklin, the inventor of pointed conductors, a name now obnoxious, as everything connected with America was sure to be, when England was in the height of her quarrel with her American dependents. These contentions disturbed the peace of the society, and some affirm that they led to the resignation of the president, Sir John Pringle, in 1777. He was succeeded in the presidency by Sir Joseph Banks (already named as having accompanied Cook to the Pacific), who occupied that honourable position for the long period of 41 years, during which the society enjoyed a large amount of fame and prosperity. Science progressed in a remarkable degree, as may be gathered from the eloquent language of Cuvier, who thus speaks of the period in question:—"During this epoch, so memorable in the history of the human mind, the scientific men of England occupy a glorious position in the intellectual pursuits common to all civilized people. They have confronted the ice of either pole; they have not left a spot of land in the whole ocean unvisited; they have increased tenfold the catalogue of the kingdoms of nature; they have peopled the heavens with planets and satellites before unknown; they have counted, as it were, the stars of the milky way; and if chemistry has in modern times assumed altogether a new aspect, the facts which they have furnished have essentially contributed to the change: hydrogen, oxygen, and carbonic acid have been discovered by them; to them, also, do we owe the decomposition of water; new and singular metals, in great number, have resulted from their analysis; the nature of the fixed alkalies was unknown until demonstrated by them. At their bidding the steam-engine and the science of mechanics have wrought miracles, and have placed their country above all others in almost every kind of manufacture; and if, as no reasonable man can doubt, such success is due much more to the general spirit of activity which pervades the nation, than to the influence of any individual, whatever his position, or however exalted his merits, it must nevertheless be admitted that Sir Joseph Banks never abused his trust, or exerted his influence but for the good of mankind."

But this good and great man was not without enemies. There were many who misunderstood and envied him, and who pretended to think the Royal Society degraded by the election of "a mere amateur," as they were pleased to call him, to the chair which Newton had filled. Sir Joseph Banks was not a mathematician, but he was a clever and assiduous naturalist, and it was but just that natural history should be honoured in his person, as mathematics had been in that of the immortal Newton. Stormy meetings on the subject ended on the 8th of January, 1784, in the passing of a resolution that "this Society do approve of Sir Joseph Banks as their President, and will support him." A few dissentient members resigned, and from that period to the end of his life Sir Joseph Banks appears to have enjoyed the full confidence of the society, although he could not always preserve general peace and unanimity.

A further proof of the royal favour was now afforded in the offer of apartments in Somerset House, and although these were in some respects less convenient than those of their own humble dwelling in Crane Court, and although, in order to occupy them, it became necessary to part with the museum, which could not be accommodated within the allotted space, yet so highly was the offer esteemed, that the council decided on embracing the proposal, and rejoiced in the more dignified position thus given to their society. Whether the accession of honour was really so great as to deserve the sacrifice of the museum (which, when close at hand, must have been of great service to the members in their studies) is a question we are not called upon to decide; but the whole of the collections were actually bestowed on the British Museum, where, among the thousands of objects of interest, they have no longer an individual existence, and no one can say, "this or that is due to the labours of the Royal Society." At the instigation of the Royal Society, and at the expense of its members, a medal was struck in memory of the lamented Captain Cook, whose massacre in 1779 caused deep regret throughout the country. In 1781 the society acquired new renown by Sir W. Herschel's discovery of a new planet which he named Georgium Sidus, that all might know it was first observed in the reign of George III., a sovereign to whom science was so much indebted, but which name was afterwards changed, at the proposal of Bode, to Uranus. The Copley medal was awarded to Sir William at the anniversary of 1781. Two years later, dissension again arose in the society, the President giving great offence by endeavouring to check the too easy admission of Fellows. He laid down two principles: first, that any person who had successfully cultivated science, especially by original investigations, should be admitted, whatever might be his rank or fortune; secondly, that men of wealth or station, disposed to promote, adorn, and patronize science, should, with due caution and deliberation, be allowed to enter. When candidates were proposed who could not be placed in either of these classes, the influence of the President was exerted to prevent their election. Great discontent often arose on these occasions, but it was not openly displayed till 1783, when it burst forth with great vehemence. Dr. Hutton, Professor of Mathematics at Woolwich, was also foreign secretary of the society, but in the opinion of the President and others, his duties at Woolwich interfered with his duty to them, so that at last they passed a resolution that the foreign secretary be required to live in London. Dr. Hutton immediately resigned, and his party took violent umbrage. The bitterness which resulted from this quarrel was fostered by the angry debates of Dr. Horsley and others, who wished to take this opportunity of overthrowing the President. This intemperate partisan threatened the secession of the mathematical party if his measures were not carried, exclaiming, "The President will then be left with his train of feeble amateurs, and that bauble* (the mace) upon the table, the ghost of that society in which philosophy once reigned, and Newton presided as her minister." But it began to be suspected that Dr. Horsley himself was aiming at the President's chair, and this was so little desired, even by his own party, that it did more than anything else to restore order. The year 1784 was a memorable one for the society, on account of the discovery (made simultaneously, as it would appear, by Cavendish and Watt) of the composition of water. In the following year Sir W. Herschel began to construct his 40-ft. telescope, the cost of which, amounting to 4000*l.*, was generously borne by the King. In 1788 the first instance of the subdivision of *scientific* labour in the metropolis occurred in the establishment of the Linnæan Society. An Italian professor, named Volta, began, in 1793, to communicate to the world, through the medium of the Royal Society, his discoveries in electricity, and won at their hands the Copley medal. Soon after the society received a valuable present of oriental manuscripts from Sir William Jones, and also a gift of 1000*l.* from Count Rumford, for the biennial bestowment of a gold and silver medal on the author of the best discovery or improvement on the subject of light or heat. The first medals were given to the Count himself, as no other discoveries had been made of equal importance with his own. In 1800 the Royal Institution in Albemarle Street originated with the Fellows of the Royal Society, and in 1807 the Geological Society. The subject of standard weights and measures occupied the attention of the Royal Society for a long period. A "Pendulum Committee" was likewise appointed, and proper persons were sent out with the north-west and the Polar expeditions to make scientific observations.

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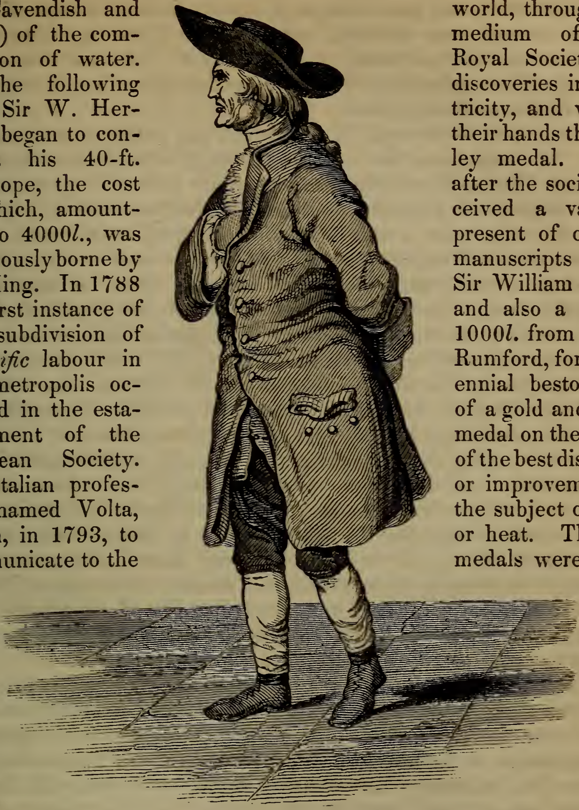
* The mace of the Royal Society was presented by Charles II. in 1663. It is of silver, richly gilt, and weighs 190 oz. avoirdupois. Embossed figures adorn it of a rose, harp, thistle, and fleur de lys, emblematic of England, Ireland, Scotland, and France. Great celebrity has been attached to this mace, under the idea that it is the identical "bauble" turned out of the House of Commons when Oliver Cromwell dissolved the Long Parliament. But not only is there no historical ground for this belief, but by diligent search Mr. Weld has discovered the original warrant, ordering a mace to be *made* for the Royal Society. This fact destroys an illusion which has given an almost sacred character to the society's mace.



HENRY CAVENDISH.

In 1801 the discoveries of Sir Humphry Davy began to draw attention to that distinguished philosopher; and from that period to 1829 there is scarcely a volume of the *Transactions* that is not enriched by a communication from him. In 1806 his paper on chemical agencies attracted the admiration of all Europe, won Napoleon's prize of 3000 fr., and was crowned by the Institute of France, though we were at open war with that country. In 1816 the safety lamp was presented and explained to the society. The coal-owners acknowledged this invention by subscribing 2500*l*. for a service of plate, which they presented to Davy.

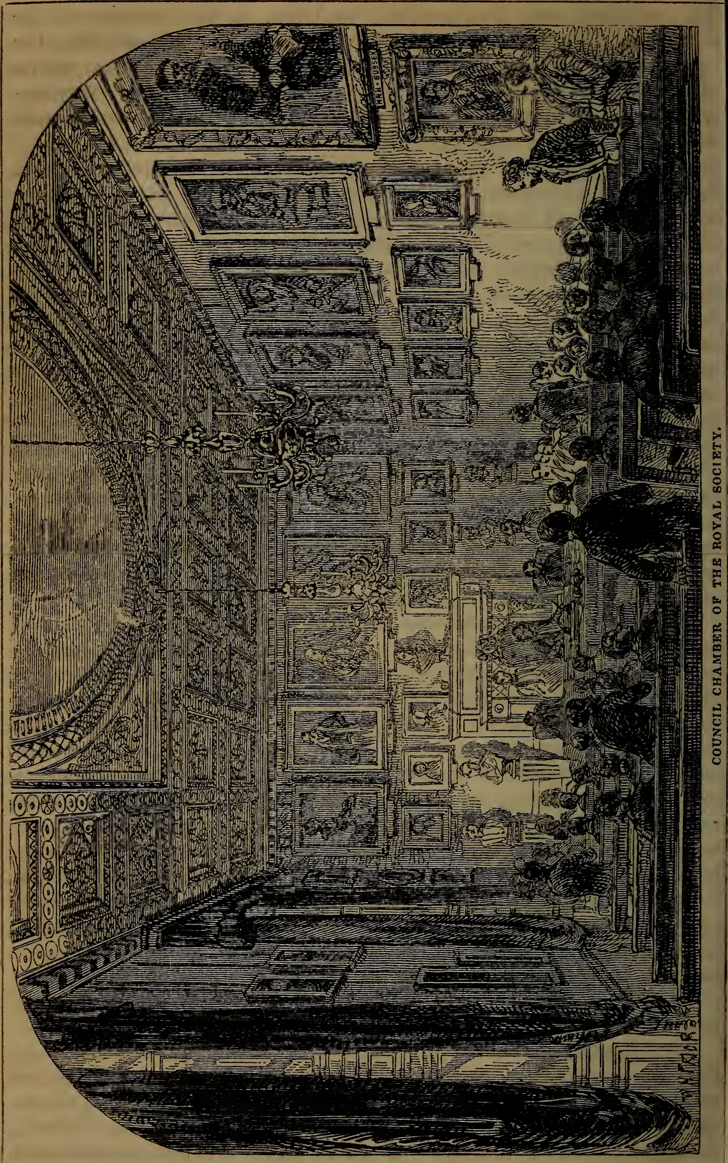
At the death of George III., in 1820, the society lost a valuable friend. The same year also took from them their respected President, Sir Joseph Banks, whose death was generally and sincerely regretted. Dr. Wollaston took his office for a few months, but could only be prevailed on to sustain it until the anniversary meeting, when it was bestowed on Sir Humphry Davy. The brilliant career of this distinguished man was nearly over when he was chosen to this highly honourable post; the following are a few of the principal events which occurred under his presidency:—geological discoveries by Dr. Buckland; philosophical communications by Sir John Herschel, and researches during the Arctic Expedition by Captain (now Colonel) Sabine, won for each the award of the Copley medal; trigonometrical operations were carried on for connecting the meridians of Paris and Greenwich; a plan for calculating and printing mathematical tables by machinery was submitted by Mr. Babbage, but, after years of labour and cost, was suspended by the withdrawal of government aid; a valuable invention for the protection of ships from lightning was made by Mr. (now Sir William) Snow Harris, and warmly approved by Sir Humphry Davy and the council, who urged its immediate adoption. Two gold medals of the value of 50 guineas each were awarded by George IV., as honorary premiums for important discoveries (they are continued by her present Majesty).

In 1827 Sir Humphry Davy, on account of declining health, resigned the Presidency, and was succeeded by Mr. Davies Gilbert.

The year previous to this event the society obtained increased accommodation at Somerset House by the grant of rooms formerly used for the business of the Lottery Office, which was still further extended some years later by the addition of the rooms of the Privy Seal Office. In 1828 Dr. Wollaston established the Donation Fund, vesting 2000*l*., the dividends from which, at his decease, were to be liberally expended in promoting experimental research. Other benefactors soon followed his example, raising the fund to 3410*l*. In 1829 the Earl of Bridgewater left 8000*l*., in order that a person or persons selected by the President, might write, print, and publish 1000 copies of a work on the power, wisdom, and goodness of God as manifested in creation. The President, with the advice of the Archbishop of Canterbury and Bishop of London, appointed eight gentlemen to write separate treatises. Thus arose the celebrated Bridgewater Treatises, which, with their authors, are very generally known. The science of meteorology was at this time earnestly studied, and a water barometer, contrived by the late Professor Daniel, was placed in the hall of the society's apartments.

That eminent man died suddenly in 1845, in the presence of the council at their meeting. In 1830 William IV., on ascending the throne, was addressed in the customary manner, and became patron of the society, declaring that "he would be proud to take every opportunity of promoting the interests of an institution whose great object is the cultivation of science, and the discovery of truth." During this year the President resigned his chair, and was succeeded by the Duke of Sussex. The opening address of his Royal Highness was one of much beauty and interest, and he thus defined the duties of the President:—"The ostensible duties, in fact, of your President are chiefly ministerial: he is your organ to ask and receive your decisions upon the various questions which are submitted to you; and he is your public voice to announce them. Though he presides at the meetings of your Council, he possesses but one voice among many; incurring an equal responsibility in common with every one of its members. He is your official representative in the administration of the affairs of the British Museum; he presides in your name, by virtue of your election of him at the board of visitors of the Royal Observatory as appointed by his Majesty's warrant; he is your medium of communication with public bodies, and with the members of the government upon the various subjects important to the interests of science, which are either submitted to your consideration or which are recommended by you through your Council for the consideration of others. For many of these functions," adds his Royal Highness, "I feel myself to be somewhat prepared by my habits of life, as well as by my public occupations; and for some of them, if I may be permitted to say so, by that very rank in which Providence has placed me as a member of the Royal Family of this country; for though it would be most repugnant to my principles and wishes, that the weight of my station should in any way influence the success of an application which it was either improper to ask or inexpedient to grant, I should feel it to be equally due to the dignity of this society and to my own, that the expression of your opinions and of your wishes should experience both the respect and the prompt attention to which it is so justly entitled." The Duke of Sussex held office as President until 1838, when he tendered his resignation, having been prevented for some time previously, by the state of his eyesight, from fulfilling all the duties of the office. The Marquis of Northampton was then elected in his room, and continued to occupy the chair of the Royal Society until the year 1849, when the present president, the Earl of Rosse, was elected.

The Council of the Royal Society consists of 21 members, including the President, of whom 10 must retire annually. There are several vice-presidents, one of whom acts as treasurer; and 3 secretaries, one of whom is foreign secretary. In addition to the Council, there are 7 scientific committees, each having its own chairman and secretary, and each labouring in its own department. Thus, there



COUNCIL CHAMBER OF THE ROYAL SOCIETY.

are the committees of Mathematics, Astronomy, Physics, Chemistry, Zoology, Botany, and Mineralogy. The library amounts to about 42,000 volumes, and is kept at the society's apartments in Somerset House. The meetings are held every Thursday, at half-past 8, P.M., from the third Thursday in November to the third Thursday in June, with the exception of a short interval at Christmas, Easter, and Whitsuntide, on Ascension Day, on the week of the anniversary meeting, and that for the election of fellows. The meeting for the election of the officers of this society takes place on St. Andrew's Day, November 30. Every Fellow is known by the initials F.R.S.

The subscription to the Royal Society is 4*l.* annually, with an admission fee of 10*l.* The annual subscription can be compounded for by the payment of 60*l.* A candidate for a fellowship must have his certificate signed by 6 fellows, 3 of whom must be personally acquainted with him. His name will be announced on the 1st of March, and his certificate suspended in the meeting-room until the first Thursday in June, when the election usually takes place. Of the total number of applicants for this honour, 15 are selected by the Council, and recommended for election; but every Fellow may use his own discretion in the matter, and may bestow his vote on some other applicant, so that the total number he votes for does not exceed 15. A majority of two-thirds is necessary in every case, and the election goes for nothing if the new Fellow omits to present himself for formal admission on or before the fourth Monday afterwards.

The accompanying engraving of the meeting-room (see the opposite page) has been made by the permission of the council. This room contains a series of highly-interesting portraits of some of the most distinguished members of the society. There are also a few busts, including that of the founder, Charles II.

THE SOCIETY OF ANTIQUARIES, SOMERSET HOUSE.

Date of Charter, 1751.

The Society of Antiquaries was founded by Archbishop Parker, in 1572, with the object of preserving such ancient historical and other documents as by the recent dissolution of religious houses, and the devastations committed at the period, were placed in jeopardy. A second object was to keep alive a taste for subjects of antiquarian interest, by the reading of papers and dissertations at their ordinary meetings. Their most active member at this period was Arthur Agard, several of whose papers were afterwards published. It was the intention of the society to apply to Queen Elizabeth for a charter of incorporation as "An Academy for the Studye of Antiquity and History, under a President, two Librarians, and a number of Fellows, with a body of statutes; the Library to be called 'The Library of Queen Elizabeth,' and to be well furnished with scarce books, original charters, muniments, and other MSS.; the members to take the oath of supremacy, and another to preserve the Library; the

Archbishop and the great officers of state for the time being, to visit the Society every five years; the place of meeting to be in the Savoy, or the dissolved priory of St. John of Jerusalem, or elsewhere." It does not appear that this charter was ever granted; but the eminent men who composed the society continued to meet weekly at the apartments of Sir W. Dethike, in the Heralds' Office, until early in the following reign, when James I. thought fit to dissolve it. This happened about the year 1604, and the society was not re-established until February, 1717, when the present Society of Antiquaries was founded, and eventually chartered in 1751.

There seems little reason to doubt that the dissolution of the first society arose from the jealousy of the government of King James, lest points should be handled which it was thought inexpedient to allow in a body of men who were in no way linked with the state, except by the common bond of allegiance. But it is also proved by the discovery of a curious manuscript (announced by the Rev. Joseph Hunter a few years ago) that King James had no unreasonable prejudices against societies of this nature, provided he was allowed to have his own share in planning and arranging them. On the contrary, he gave the greatest encouragement to a scheme proposed to him by the learned antiquary, Edmund Bolton, which, from its vastness and magnificence, shows an elevated notion of the dignity of the literary character. This was nothing less than to convert the Castle Royal of Windsor (as being from its elevated site the fittest place), or, if not Windsor, what other place his Majesty shall be pleased to appoint, into an English Olympus, and here to assemble a company of select persons with particular privileges, fees, and ornaments, incorporated under the title of a brotherhood or fraternity, associated for matters of honour and antiquity, and under a certain canon of government. This fraternity was to consist of three classes of persons, who were to be called *Tutelaries*, *Auxiliaries*, and *Essentials.* The Tutelaries were to be Knights of the Garter, with the Lord Chancellor, and the Chancellors of the two Universities; the Auxiliaries were to be selected from the flower of the nobility; and the Essentials, or working men, were to be culled from the ablest and most famous lay-gentlemen of England. Speaking of their proposed duties, Bolton says, " When among the many public services of the main body of the academy, consisting only of Essentials, the superintending of the review, or the review itself, of all English translations of secular learning (one of which, being of an author of high account and sovereign use, his Majesty named with much dislike), that good books might be sincerely turned out of foreign tongues into ours, was propounded, his Majesty did assent thereunto, gladly acknowledging that false weights and measures in words were as diligently to be discovered, and as equally to be detected, as in wares, and rather by so much more as things intellectual are more excellent than things palpable or corporeal; and did also add of his own accord, that it should be theirs to authorize all books and writings which were to go forth in print which did not *ex professo* handle theological arguments; and to give to the vulgar people indexes expurgatory and expunctory upon all books of secular learning printed in English never otherwise to be public again."

According to Bolton, the King grew more and more in favour with the scheme, confirming with his royal assent, and "granting many gracious and illustrious favours, privileges as well to the thing as to the persons." The society was to be called the Academy Royal of King James, and was to be a corporation with a royal charter, to have a mortmain of 200*l*. a year and a common seal. The device for the seal was submitted to the King, and all seemed on the point of completion. One great meeting was to be held on St. James's Day, in honour of the King, and afterwards the annual meetings were to be held on St. George's Day. While everything seemed thus to promise a great and important society, and before the necessary steps had been gone through for the establishment of a new chartered community, the King died, and this event was fatal to the whole scheme. His successor was less favourably disposed, and too much occupied to carry it out. In fact, the whole plan was too ambitious, and on too gigantic a scale to be fully embraced by less sanguine minds than Bolton's. Charles I. is reported to have said that it was "too good for the times."

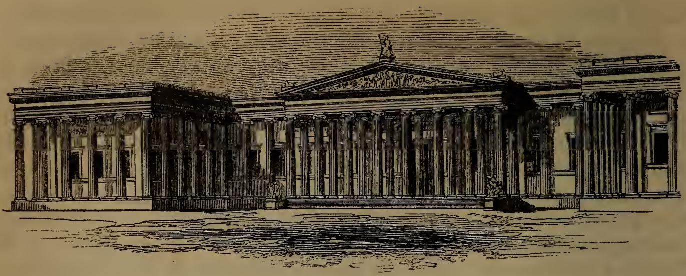
From this period, until the establishment of the present Society of Antiquaries in 1717, the public has to thank a few learned and zealous individuals for having preserved, by their separate labours, a knowledge of many interesting antiquities, and a large amount of valuable records of the past. The first president of the revived society was Peter le Neve, Esq., an eminent preserver of antiquities. He had at first joined a weekly meeting of persons favourable to this study at the Bear Tavern in the Strand, then at a tavern in Fleet Street, called the Young Devil, and, finally, at the Fountain Tavern, opposite Chancery Lane, where these private meetings seem to have been held for several years before the public step was taken of giving the society a regular form, and taking minutes of its proceedings. The number of members was at first limited to 100, and no honorary ones were allowed. They removed to apartments in Gray's Inn, afterwards to the Temple, and then to Chancery Lane. Some attempts were made to connect them with the Royal Society; but no other accommodation was agreed upon than that of holding their meetings on Thursday evenings after the Royal Society's meeting had broken up. In 1751 the society obtained a royal charter, being incorporated under the title of the President, Council, and Fellows of the Society of Antiquaries of London, and empowered to have a body of statutes and a common seal, and to hold in perpetuity lands, &c., to the yearly value of 1000*l*. The admission fee to this society is fixed at 8 guineas, and the annual payment at 4 guineas.

The society is now established in apartments at Somerset House. Their Transactions, called the Archæologia, contain a fund of curious and interesting matter. They commenced in 1770. The days of meeting are every Thursday from November to June, and the annual meeting is held on the 23rd of April. The usual forms of recommendation, as in the case of other societies, are necessary to admission to membership.

BRITISH MUSEUM, GREAT RUSSELL STREET.

The British Museum originated with a bequest from Sir Hans Sloane, a most industrious naturalist, of whose history the following sketch may not be unacceptable to our readers. Born in the north of Ireland, but of Scottish family, young Sloane showed an early love of natural history and medicine, and was carefully educated accordingly. At 16 years of age he was attacked by spitting of blood, which dangerous symptom caused him permanently to adopt a strict regimen, and to abstain from the use of all stimulating liquors. Continuing this course ever afterwards, he not only enjoyed a fair proportion of health, but lived to an unusual age. After many years of diligent study he settled in London as a physician, and became a Fellow of the Royal Society; but in three years we find him embarking for Jamaica as physician to the Duke of Albemarle, governor of that island. Owing to the death of the Duke, he was only fifteen months in Jamaica, but he managed to accumulate a vast number of specimens in natural history, which afterwards formed the nucleus of his museum, on which he spent large sums of money, enriching it in every possible way. He was appointed physician to Christ's Hospital, but never retained his salary, always devoting it to charity. In 1716 he was created a Baronet by George I., and in 1727 he became physician in ordinary to George II. In the same year he attained the highest honour a scientific man could receive in being appointed to succeed the great Newton in the chair of the Royal Society. He exercised the duties of this office with the greatest zeal until he arrived at the age of fourscore, when he resigned it, and retired altogether from public life. At his own manor-house at Chelsea he lived on to the great age of 93, when a brief illness terminated his life in the year 1753. He bequeathed his museum to the public on condition that 20,000*l.* should be paid to his family, the first cost of the whole having amounted to at least 50,000*l.* His books and manuscripts were included in this bequest, the former consisting of 50,000 volumes. The conditions offered by Sir Hans Sloane were responded to by Parliament, and his museum became the property of the nation. At the same time the Harleian Manuscripts were purchased by government, and the whole, with the Cottonian Library, which had been given for public use in the reign of William III., was formed into one general collection. A mansion in Great Russell Street, called Montagu House, was purchased of the Earl of Halifax, for 10,250*l.*; and between the years 1755 and 1759 the different collections were removed into it, the new institution being thenceforth called *the British Museum.* As the contents of the Museum became more multiplied, new steps were taken, as thus detailed in the Synopsis sanctioned by the trustees:—"Till the arrival of the Egyptian Antiquities from Alexandria in 1801, Montagu House was competent to the reception of all its acquisitions. The Egyptian monuments, most of them of too massive a character for the floors of a private dwelling, first suggested the necessity of an additional building, rendered still more indispensable by the purchase of the Townley Marbles in 1805. A gallery adequate to the reception of both was completed in 1807, after which, although the trustees meditated, and had plans drawn for new buildings, none were undertaken till 1823, when, upon the donation from his Majesty King George IV. of the library collected by King George III., the government ordered drawings to be prepared for the erection of an entire new Museum, a portion of one wing of which was to be occupied by the recently-acquired library. This wing, on the eastern side of the then Museum garden, was finished in 1828; and the northern and a part of the western compartment of a projected square have been since completed. The principal floor of the northern portion is devoted to the general library, removed from the former house; that of the western, both below and above, to ancient sculpture and antiquities generally. A part of the lower floor of the eastern wing is devoted to the library of MSS. The upper floors, both of the eastern and northern sides of the square, contain the collections of Natural History. The new southern front of the Museum is at present in progress. The last remains of the original building was removed in 1845." The new buildings were designed by Sir Robert Smirke, and are entered by a massive portico, which was not completed till 1847.

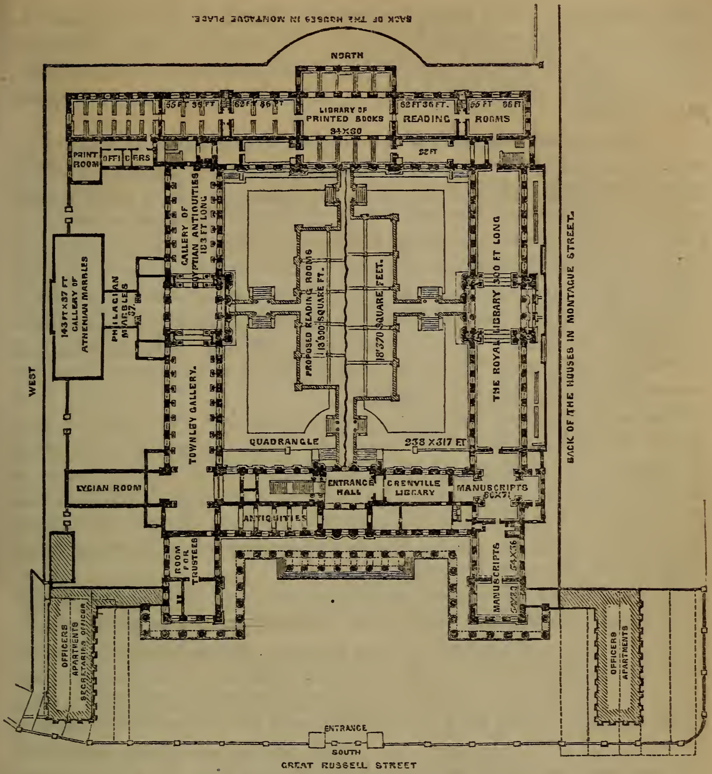
Among all the antiquities for which the British Museum is famous, the most celebrated are the Elgin marbles, a collection of exquisite specimens of Grecian art, which have been the wonder and admiration of sculptors, and of all who have taste to appreciate their beauty, since the Earl of Elgin brought them to this country in 1801. These marbles adorned the Parthenon at Athens, a model of which building assists the visitor to understand the position once occupied by statues and bas-reliefs, now arranged in their mutilated state around the walls and on raised stages in what is called the *Elgin Saloon.* Marbles contemporary with these, found in the ruins of the Temple of Apollo Epicurius, near the ancient city of Phigalia, are arranged in the *Phigalian Saloon.* The Temple of Apollo was built by Ictinus, an architect of the time of Pericles, who also built the Parthenon. A series of tombs, bas-reliefs, and statues, of an earlier date than the Parthenon, were discovered in the ruined city of Xanthus, and brought to England by Sir Charles Fellowes. These are called the *Xanthian* or *Lycian Marbles.* A series of very ancient and interesting marbles brought from the supposed site of Nineveh, on the left bank of the Tigris, have



BRITISH MUSEUM.

recently been added to the Museum through the zeal and laborious researches of Dr. Layard. A grand central saloon and several other rooms are devoted to remains of Greek and Roman art. Among these are forms of exquisite beauty, grace, and truth, which afford to modern sculptors and artists most valuable subjects for study. But perhaps the most popular part of the gallery of antiquities, to the great masses of visitors who crowd the Museum on holiday occasions, is that which contains the colossal sculptures of Egypt. These huge relics of an extraordinary people cannot fail to impress the beholder with wonder and curiosity. He longs to see the body to which that huge fist belonged, or the Sphinx which bore that immense but finely-wrought ram's head. The swarthy heroes of the Nile seem to look down on him with a calm sense of superiority; and as he views their colossal proportions, and looks around on ancient stone coffins, also of colossal size, he can hardly persuade himself but that there were giants in those days, and that these were the works of their hands. He might even go on to fancy that the insect world of Egypt presented the same exaggerated proportions, for here we find a beetle in dark granite of such a size that a man cannot sit comfortably astride upon its back. This represents the sacred Scarabæus of Egypt. Another interesting and important object is the Rosetta stone, which first suggested to Dr. Thomas Young a mode of deciphering the mysterious inscriptions on Egyptian monuments. This stone bears the same inscription in three different characters, one in hieroglyphics, one in a written character called *enchorial*, and the third in Greek. Thus by means of the Greek inscription the hieroglyphics were for the first time rendered intelligible.

Besides the Egyptian Saloon, there is another collection of antiquities from Egypt in an upper room called the *Egyptian Room.* These consist of figures of various deities in silver, bronze, porcelain, wax, steatite, wood, &c.; various articles of household furniture; a collection of objects for dress and the toilet; a great number of vases, lamps, and miscellaneous articles; but above all in real interest, a large collection of human mummies, male and female, and also mummies of numerous animals, as the cat, dog, dog-headed baboon, bull, ram, sheep, lamb, ibis, crocodile, snake, &c.


BACK OF THE HOUSES IN MONTAGUE PLACE.
NORTH
55 FT 38 FT
62 FT 36 FT
LIBRARY OF PRINTED BOOKS 94X30
52 FT 36 FT. READING
55 FT 36 FT ROOMS
52 FT
PRINT ROOM
OFFICERS
GALLERY OF EGYPTIAN ANTIQUITIES 183 FT LONG
143 FT X 37 FT GALLERY OF ATHENIAN MARBLES
PHILAGIAN MARBLES 37
WEST
TOWNLEY GALLERY.
PROPOSED READING ROOMS 13'500 SQUARE FT.
18'370 SQUARE FEET.
THE ROYAL LIBRARY 300 FT LONG
BACK OF THE HOUSES IN MONTAGUE STREET.
QUADRANGLE
238 X 317 FT
LYCIAN ROOM
ENTRANCE HALL
GRENVILLE LIBRARY
MANUSCRIPTS 60X71
ANTIQUITIES
ROOM FOR TRUSTEES
MANUSCRIPTS 54X36
OFFICERS APARTMENTS SECRETARIES OFFICES
OFFICERS APARTMENTS
ENTRANCE
SOUTH
GREAT RUSSELL STREET

GROUND PLAN OF THE BRITISH MUSEUM.

The above is the plan, with the addition of Mr. Fergusson's proposed suggestions for additional accommodation.

Next the Egyptian Room is the Bronze Room, containing valuable Greek and Roman bronze figures, a collection of vases, terra cottas, &c. The celebrated Etruscan vases are in a separate room.

The Medal Room contains a large collection of coins and medals, of which Sir Hans Sloane's and Sir Robert Cotton's collections were the basis. Great additions have been made through the munificence of King George IV., and also by the bequests of the Rev. C. M. Cracherode and R. P. Knight, Esq., and the gifts of Lady Banks and W. Marsden, Esq. It comprehends—1, Ancient Coins; 2, Modern Coins; 3, Medals. "The Greek coins are arranged in geographical order, and include all those struck with Greek characters, in Greece or elsewhere, by kings, states, or cities, which were independent of the Romans. With these are also placed the coins of free states and cities which made use of the Etruscan, Roman, Punic, Spanish, or other character. The Roman coins are placed, as far as it can be ascertained, in chronological order." The modern coins consist of Anglo-Saxon, English, Anglo-Gallic, Scotch and Irish coins, and likewise the coins of foreign nations. The coins of each country are kept separate.

The Zoological collection of the British Museum is a very fine one, and is contained in five rooms. The first room contains skulls of the larger mammalia, tubes of annulose animals, &c. The second room contains a collection of reptiles, &c., preserved dry and in spirits; a portion of the radiated animals, a variety of lizards, snakes, serpents, tortoises, crocodiles, batrachian animals, and star-fish. The third room displays apes and monkeys in great variety, rats, beavers, squirrels, porcupines, rabbits, &c., while the tables are covered with beautiful specimens of coral. The fourth room contains fish, insects, and crustaceous animals. The fifth, various forms of sponge and molluscous and radiated animals in spirits.

The mineralogical collection is very extensive and valuable, and affords admirable opportunities of study to the student of this branch of science. It is arranged in sixty cases, contained in four rooms in the North Gallery. The system followed is, with slight deviations, that of Berzelius, founded upon the electro-chemical theory of definite proportions, as developed by him in a memoir read before the Royal Academy of Science at Stockholm.

The collection of organic remains is not yet perfectly arranged. It commences with fossil vegetables. Then come the osseous remains of large reptiles, with some of the gigantic extinct species; then various mammalian remains. A complete skeleton of the large extinct elk of the Irish bogs, of the American mastodon, and other fossil wonders, occupy the fifth and sixth rooms of this collection, and at the west end of the latter is the fossil human skeleton, embedded in limestone, brought from Guadaloupe by the Hon. Sir A. Cochrane.

The Library of the British Museum contains about 500,000 volumes, and is visited by about 70,000 readers during each year. There are two spacious reading-rooms for their use (which are entered from Montague Street, Russell Square), where every accommodation is afforded in the pursuit of their studies. The access to these rooms, however, is to be sought by an application to the chief librarian, backed by a proper recommendation*; and the ticket of admission has to be renewed half-yearly. No books are allowed to be taken away for perusal, and while the individual is using them in the library, he is responsible for their safety. This library ranks in importance with the best continental libraries, but the number of separate works is greater in Munich and Paris.

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* This is so very indefinite as to require, in behalf of the public, some revision on the part of the trustees. It is left too much to the will of the librarian, as to whom he may in his temper think a proper person to recommend. My own case may not be singular; I have contributed in the course of my career, as publisher, books to something not far from a thousand pounds in value, yet this Public Servant negatived my recommendation of Mr. Robert Armstrong, engineer, who, as a scientific man, was desirous of a reading ticket,—remarking to that gentleman, "Weale, publisher! who is he? *WE* don't like the recommendations of Booksellers."—Ed.

Our library is especially rich in manuscripts. The Print Room in connection with it contains valuable engravings, etchings, and drawings, but this, as well as the Medal Room, already noticed, can only be seen by very few persons at a time and by special permission.

ROYAL COLLEGE OF SURGEONS, LINCOLN'S INN FIELDS.

The Royal College of Surgeons, situated on the south side of Lincoln's Inn Fields, was established in its present form in 1800; and in the same year the museum of comparative anatomy of the celebrated John Hunter was presented by government to the institution, on the condition that twenty-four lectures should be delivered annually, and that the museum should be open to the public. The Royal College of Surgeons was founded upon an ancient company of Barber Surgeons, which was chartered in the reign of Edward IV., at which period the healing art, when not practised by the clergy, fell very much into the hands of barbers, who were attendants on the bath, applied ointments, &c. In the reign of George II. an act was passed dissolving the connection between barbers and surgeons, and raising the latter into a distinct company as practitioners of a scientific art. In the 40th year of the reign of George III. this company was confirmed in its privileges by royal charter, and a new title and improved constitution granted. Its affairs are governed by a council chosen for life from those members whose practice is confined to surgery. The examiners are chosen in order of seniority from the members of council, and admit qualified persons as members, granting them a diploma which confers upon them the right of practising surgery in any part of the British dominions.

The Hunterian collection, which forms the basis, and still a large proportion, of the contents of the present museum of the Royal College of Surgeons of England, was originally arranged in a building which its founder, John Hunter, erected for it in 1785, behind his house in Leicester Square. The museum was opened for inspection during the month of October to the medical profession, and in May to non-professional persons. John Hunter died October 16th, 1793, aged 65. By his will he directed his museum to be offered, in the first instance to the British government, on such terms as might be considered reasonable, and in case of refusal to be sold, in one lot, either to some foreign state, or as his executors might think proper. Accordingly Parliament voted the sum of 15,000*l.* for the museum, and an offer of it was made to the Corporation of Surgeons, and accepted on the terms proposed by government, which were as follows:—

1st. The collection shall be open four hours in the forenoon of two days every week for inspection and consultation of the fellows of the College of Physicians, the members of the Company of Surgeons, and persons properly introduced by them; a catalogue of the preparations, and a proper person to explain it, being at those times always in the room.

2nd. That one course of lectures, not less than twenty-four in number, on comparative anatomy and other subjects, illustrated by the preparations, shall be given every year, by some member of the company.

3rd. That the preparations shall be kept in a state of preservation, and the collection in as perfect a state as possible, at the expense of the Corporation of Surgeons, subject to the annual inspection and superintendence of the trustees.

4th. That there shall be a board of trustees, to consist of sixteen members, by virtue of their public offices, and of fourteen others, to be appointed in the first instance by the Lords of the Treasury, and afterwards to be elected, as vacancies may happen, by a majority of the remaining trustees.

5th. That the museum shall always be open for the inspection of all or any of the said trustees, who are to take care that the Corporation of Surgeons perform their engagements respecting the said collection. That a day be appointed for the annual inspection of the museum, by the trustees acting collectively as a board; and that they are also to have quarterly meetings, for the transacting of any business relative to the museum, and for the filling up of such vacancies as may happen in the number of the trustees; and that the Corporation of Surgeons shall engage some person to officiate as secretary to the board, upon such occasions, and to issue previous notices to the members, in which he is to state particularly whether any vacancies are to be filled up by new elections.

In 1806 the sum of 15,000*l.* was voted by Parliament in aid of the erection of an edifice for the display and arrangement of the Hunterian collection; a second grant of 12,500*l.* was subsequently voted, and sums of equal amount having been supplied from the funds of the college, the building was completed in Lincoln's Inn Fields, in which the museum was opened for the inspection of visitors in the year 1813. From the number of the additions, the museum, completed in 1813, became too small for their adequate display and arrangement; and more space being at the same time required for the rapidly increasing library, the present building was erected, wholly at the expense of the college, in 1835, at a cost of about 40,000*l.*, and the Hunterian and collegiate collections were re-arranged in the present museums, which were opened for the inspection of visitors in 1836.

The superintendence of the museum is confided by the council of the college to a committee of its members, who, as opportunities offer, recommend the purchase of specimens desirable for the collection; and in this manner upwards of 40,000*l.* has been expended. A valuable portion of the additions has been by liberal donations from Sir Everard Home, Sir William Blizard, Mr. Cline, Mr. Swan, and other members of the college; other valuable donations have been received from distinguished cultivators of natural science, not members of the medical profession. The largest amount of additions recently made to the collection has been to its Osteological and Pathological departments. The catalogue of the pathological specimens, with illustrative drawings and explanatory histories, is in progress, and will shortly be completed.

ROYAL COLLEGE OF PHYSICIANS, TRAFALGAR SQUARE.

This important medical body received a royal charter in 1518, in the reign of Henry VIII., "that they, and all men of the same faculty, of and in the City of London, should be in fact and name one body, and perpetual community or college." The first meetings of the body were held at No. 5, Knight-Rider Street, which house still belongs to them; but, on the accession of Charles I., they removed to a house at Amen Corner. The great fire consumed this house, and nearly the whole of the library, after which a new college was built in Warwick Lane. Here the Fellows held their meetings until 1825, when the present new college, at the north-west corner of Trafalgar Square, was opened, and an elegant Latin oration delivered by the president, Sir Henry Halford.

Candidates for diplomas undergo three examinations at this college, at three separate meetings of the censors' board, the *viva voce* part of each being carried on in Latin. These examinations are strict, and afford good security to the public that none but those who have had a liberal and learned education can hope for success, and that the order of English physicians shall always consist of men who will do honour to their profession, by their general abilities and high qualifications. (See "Colleges.")

ROYAL INSTITUTION, ALBEMARLE STREET.

The Royal Institution of Great Britain was incorporated in the year 1800. It owes its origin to the Fellows of the Royal Society, who purchased a spacious and commodious house in Albemarle Street, with the intention of further "diffusing the knowledge and facilitating the general introduction of useful mechanical inventions and improvements; and for teaching, by courses of philosophical lectures and experiments, the application of science to the common purposes of life." It was part of their plan to receive for public exhibition in these rooms, "all such new mechanical inventions and improvements as shall be thought worthy of public notice, and more especially of all such contrivances as tend to increase the conveniences and comforts of life, to promote domestic economy, to improve taste, or to advance useful industry." At this time, the managers of the new institution had no idea of the research and the brilliant discoveries which were to be carried on and accomplished by its means. On the first founding of this institution, some fears were expressed that it would interfere with the interests of the Royal Society, but this is so far from being the case that it has ever been found a most valuable friend and ally. It has indeed been not unaptly called "the workshop of the Royal Society," for here the ideas and inventions of the most eminent members of that society have been successfully worked out. Seventeen years after its foundation, its successful career was thus alluded to by one of its members:—"The history of chemical science must for ever date one of its principal epochs from the foundation of the laboratory of the Royal Institution. . . . . A new power of nature was developed by the experiments of Galvani, and a new and powerful instrument of research combined by the genius of Volta. The experimentalists of our school were not behind others in their investigations of the laws of galvanism; and various were their improvements in the voltaic apparatus, till its splendid powers were first fully displayed in giant greatness in the battery of the institution. The impulse which was given to science by these striking discoveries vibrated to every part of the civilised world, and the crowded lectures, in which such wonderful novelties were displayed with all the powers of eloquence, and all the aids of a splendid apparatus, contributed not a little in this country to the rapid diffusion of a taste for philosophic inquiry."

"In the laboratory of this institution," says Mr. Weld, "the illustrious Davy carried on those elaborate investigations, and made those brilliant discoveries, which were communicated to the scientific world through the medium of the Transactions of the Royal Society; and within the same walls has Dr. Faraday followed his great predecessor, laying open the secrets in nature's laboratory, and, like him, making discoveries which will cause his name to be held in admiration and esteem by future generations."

The nature of this institution, as it now exists, will be best understood by the following extracts from the authorised prospectus. The patron and vice-patron are Her Most Gracious Majesty Queen Victoria, and His Royal Highness Prince Albert.

The chief objects of the ROYAL INSTITUTION are:—

1. To further scientific research.
2. To teach the principles of inductive and experimental science.
3. To exhibit the application of these principles to the various arts of life.

The ROYAL INSTITUTION comprises:—

I. A THEATRE FOR PUBLIC LECTURES.—These lectures are intended to supply that which books or private instruction can rarely afford—experimental exhibition, highly illustrated delineation, or detailed descriptions of matters connected with science or art.

II. A LABORATORY for the promotion and advancement of chemical and electrical science, by experiments and original investigations, and by courses of systematic lectures. In this laboratory the researches of Professor Davy, and afterwards of Professor Faraday, extending over a period of nearly half a century, have been conducted. The laws of electro-chemical decomposition—the decomposition of the fixed alkalies—the establishment of the nature of chlorine—the philosophy of flame—the condensibility of many gases—the science of magneto-electricity—the two-fold magnetism of matter, comprehending all known substances—the magnetism of gases—are the results of investigations carried on in the laboratory of the Royal Institution during the last forty-eight years. The cost of these researches has been defrayed by the willing contributions of the members without any aid from the government of the country.

III. LABORATORY LECTURES.—These are delivered at four o'clock, P.M., from the end of January to the end of April. They are designed for the further instruction of persons already acquainted with the principles of chemistry.

IV. A LIBRARY of above 22,000 volumes, including the best authors in the Latin and Greek Languages—the writings of the ancient Fathers of the Church—English County Histories—Works of Science and Literature, of Art and Antiquarian Research. Of this library a classed Catalogue has been made, which may be purchased by the members of the Institution.

V. A MUSEUM containing mineral specimens, many of which are named, and also other collections. The chief object of this museum is to furnish illustrations for the lectures and the Friday evening discourses.

VI. A READING ROOM, in which the principal newspapers and journals in the English, French, and German Languages are regularly taken in.

VII. WEEKLY MEETINGS OF THE MEMBERS OF THE INSTITUTION.—These are held on every Friday evening during the session, and the members have the privilege of introducing two friends to them by tickets. The object of these meetings is to bring together men of literature and science, and to afford opportunities of communicating, by discourses in the Theatre, either new views or new applications of known truths, and of demonstrating by experiment, and familiarizing by description, new results which have recently been recorded in the Scientific Memoirs of Philosophical Societies.

TERMS OF ADMISSION.—Members are balloted for on the first Monday of every month, and pay an admission fee of six guineas, and an annual payment of five guineas, the first year being paid in advance at the time of admission, or sixty guineas, in lieu of all payments. Members are admitted to all lectures delivered in the Institution, to the museum, and to the weekly evening meetings, and have the privilege of introducing by tickets, two friends to each of the weekly evening meetings, and the right of voting at the monthly meetings.

And for every additional subscription of twenty guineas at one time, or three guineas per annum, each member is entitled to introduce, personally, or by a written order, one visitor to each of the public lectures.

The sons and daughters of the members of the Royal Institution, under the age of twenty-one, are admitted to all the public lectures and to the museum, on the annual payment of one guinea each.

Annual subscribers pay five guineas, and one guinea to the Library Fund on admission. They are admitted to all the public lectures delivered in the Theatre of the Institution, to the libraries and to newspaper rooms, but have not the privilege of attending the evening meetings.

Subscribers to the general lectures only, pay two guineas for the season, or one guinea for each course of public lectures delivered in the Theatre of the Institution.

Subscribers to the laboratory lectures only, pay two guineas for that course; but if they also subscribe to the general lectures, the payment will be one guinea, making three guineas for all the courses.

LINNÆAN SOCIETY, 32, SOHO SQUARE.

Date of Charter, 1802.

The Linnæan Society, for the promotion of zoology and botany, was founded in 1788, by Dr. (afterwards Sir James Edward) Smith, and received a royal charter in 1802. Its intention and objects are best explained in the founder's introductory discourse. "It is altogether incompatible with the plan of the Royal Society, engaged as it is in all the branches of philosophy, to enter into the minutiæ of natural history: such an institution, therefore, as ours is absolutely necessary to prevent all the pains and expense of collectors, all the experience of cultivators, all the remarks of real observers, from being lost to the world. . . . . . . We have yet much to learn concerning many plants, which authors copy from one another as the produce of Great Britain, but which few have seen; and our animal productions are still less understood. Whatever relates to the history of these, their economy in the general plan of nature, or their use to man in particular, is a proper object for our inquiries. . . . . . . A kind of knowledge which naturalists have a right to expect from us in a superior degree, is the accurate determination of the species described by Linnæus; and, indeed, those of many other authors. Our access to several original collections—to the immense herbarium of Sir Joseph Banks, which contains the entire collections of several celebrated botanists, but more especially to the very herbarium and museum of Linnæus himself—must give us a means of knowledge not to be had elsewhere. A train of events which I cannot help calling most fortunate, having brought into my hands everything which Linnæus possessed relating to natural history or medicine, his entire library, manuscripts, and the correspondence of his whole life, as well as all the acquisitions made by the younger Linnæus in his tour through Europe, will be a never-failing resource to us in every difficulty, as well as a fund of information, not easily to be exhausted."

The fortunate circumstances here alluded to, were as follows:—While Smith was yet a young student, he happened to be breakfasting with Sir Joseph Banks, who informed him that the collections of Linnæus had been offered to him (Sir Joseph) for 1000 guineas, but that he had no intention of becoming the purchaser. Upon this young Smith became exceedingly anxious to possess them, and persuaded his father, though with difficulty, to consent to the purchase. It may appear strange that Sweden should consent to part with the treasures of her far-famed naturalist; and indeed the King, Gustavus III., who had been absent in France, was much displeased, on his return, at hearing that a vessel had just sailed for England with these collections. He immediately dispatched a vessel to the Sound to intercept it, but was too late. The herbarium, books, MSS., &c., arrived safely in London, in 1784, packed in twenty-six cases, and cost their purchaser 1088*l*. 5*s*. In 1785 Smith was elected a Fellow of the Royal Society, and devoted himself more to botanical studies than to his profession as a physician; in 1792 he had the honour of being engaged to teach botany to Queen Charlotte and the Princesses; and he was knighted by the Prince Regent in 1814. At his death, in 1828, the celebrated collection, with Sir J. E. Smith's additions, was purchased by the Linnæan Society, and still remains in their possession.

The Linnæan Society occupies the front part of the house in Soho Square where Sir Joseph Banks resided; the rooms in which Sir Joseph received the Fellows of the Royal Society are occupied by Robert Brown, Esq., F.R.S., to whom Sir Joseph bequeathed the life-use of his library, collections, &c., and an annuity of 200*l.*

The museum of the Linnæan Society is very rich in the botanical department, containing the herbaria of Linnæus, Smith, Pulteney, Woodward, Winch, &c., with a valuable herbarium presented by the East India Company, in 1833. The entomological collections are also very extensive: the zoology relates chiefly to Australian marsupials, birds, and reptiles, and there is a fine collection of shells. The library is well stored with botanical works in particular. The Linnæan Society, like the Royal Society, publishes its *Transactions,* and these contain a variety of valuable papers.

Candidates for admission to the Linnæan Society, must be proposed by three or more Fellows. The admission fee is six pounds, and the annual subscription three pounds; or, in lieu of future payments, a composition of thirty pounds can at once be paid. This latter method is imperative on all members not usually resident in Britain. The Fellows are entitled to receive, *gratis,* all the *Transactions* published by the society, after their election, and they may be supplied with the previous volumes, at a reduction of twenty-five per cent. under the common selling prices.

The library is open to all members of the society, between the hours of twelve and four, on Monday, Tuesday, and Thursday; and the museum on Wednesday and Friday; and Fellows may introduce their friends in person, but not otherwise. Members may obtain the loan of books; but no more than two books can be borrowed at one time, nor is any book to be kept longer than six weeks.

The ordinary meetings are held on the third Tuesday in January, the first and third Tuesdays in February, March, and April, the first Tuesday in May, and the first and third Tuesdays in June, November, and December, at eight o'clock in the evening; and every member may introduce a friend.

The anniversary meeting, for the election of council and officers, is held on the 24th of May, or on the following day if the 24th should happen on a Sunday.

Fellows of this society are known by the initials F.L.S.

HORTICULTURAL SOCIETY, 21, REGENT STREET.

Date of Charter, 1809.

The Horticultural Society of London was established in 1804, and incorporated by royal charter in 1809; its object being the improvement of horticulture in all its branches, ornamental as well as useful. The business of the society is directed and executed by a council, president, treasurer, auditors, and secretary. These officers, and three new members of the council, are elected on the first of May yearly, which day is observed as the anniversary of the society.

The general meetings of the Fellows are held at the house of the society in Regent Street, on such days of such months as the council may determine from time to time. At these meetings, communications on new or important subjects in horticulture, are read; fruits, vegetables, and flowers, are shown; and seeds, cuttings, grafts, and plants are occasionally distributed to the Fellows present. Visitors introduced by the personal or written authority of a Fellow, or the wives of Fellows without an introduction, are admitted. In addition to the business above mentioned, candidates to become Fellows and Members of the society are balloted for, and medals are awarded to meritorious exhibitors.

Every candidate for admission into the society as a Fellow, is to be proposed by three or more Fellows, one of whom must be personally acquainted with him. He will then be balloted for after the certificate has been read at two general meetings of the society; unless the candidate is a peer or peeress, or the certificate has been signed by the chairman of the council, on the part of the council, in which cases the candidate may be balloted for at the same meeting at which the certificate is first read. The fee to be paid on the election and admission of a new Fellow is two guineas, and the contribution to the society in each year four guineas, which charge is payable on the 1st of May, for the year preceding, but may be compounded for by the payment of forty guineas at any one time, before the contribution of the current year becomes due. Persons whose business or profession is horticulture, and who have gained a medal, or contributed a paper to the Journal of the society, are admitted on payment of one guinea admission, and one guinea annual subscription.

A selection from the papers read to the society, accompanied with figures, is published under the direction of the council, in quarterly parts, forming portions of an octavo Journal, and is distributed gratuitously to all Fellows of the society.

The society has an extensive garden at Chiswick, five miles from London, laid out tastefully, and filled with rare and interesting plants. It is open from nine o'clock every day, except Sunday, or other days specially excepted, for the inspection of Fellows of the society or their wives or sisters, without orders, and for visitors introduced by the Fellows, either personally or by order. From this garden, seeds, plants, and cuttings, of species not commonly to be had in the nurseries, are supplied gratuitously to the Fellows of the society, under the authority of the Garden Committee.

Three exhibitions are annually held at the garden of the society, at which medals are awarded to the best exhibitors. On these occasions Fellows only are admitted without tickets; and, for the admission of their friends, are entitled to purchase tickets, part of which are issued to them at a lower price than to the public.

The library of this society consists principally of books on subjects relating to horticulture; it has been formed by purchases and presents, and contains now the most considerable collection of horticultural works in the kingdom. There is also a collection of drawings of fruits and ornamental plants kept for the inspection of the Fellows.

Fellows of this society use the initials F.H.S. after their names.

GEOLOGICAL SOCIETY, SOMERSET HOUSE.

Date of Charter, 1826.

The Geological Society of London was instituted in 1807, but did not receive its charter till 1826. Its origin and progress, as traced by the historian of the Royal Society, are as follows:—Dr. Babington, senior physician to Guy's Hospital, learned in chemistry and mineralogy, was anxious to publish an elaborate monograph by Count Bournon, on carbonate of lime. He therefore invited a number of mineralogists to his house, and opened a subscription for the purpose. When this primary object was accomplished, the same gentlemen continued to meet for friendly intercourse and mutual instruction, and thus formed the commencement of the Geological Society. Their zeal must have been very great to enable them to accommodate themselves to Dr. Babington's hours, the only time which he could spare from professional duties being seven in the morning! But, as it has been well remarked, "the spirit which prevailed in the infancy of this society, and to which the society owes its vigorous growth, was one which did not shrink from difficulties and sacrifices." One of the founders of the society was Sir Abraham Hume, who was particularly conversant with natural history and mineralogy. He was always ready with his purse and his exertions to aid the society, and he diligently performed the duties of vice-president from 1809 to 1813. The fame of his mineralogical collections also promoted a taste for such studies. The early purposes of the society were "to multiply and record observations, and patiently to await the results at some future period; and it was their favourite maxim that the time was not yet come for a general system of geology; but that all must be content for many years to be exclusively engaged in furnishing materials for future generalizations. By acting up to these principles with consistency, they in a few years disarmed all prejudice, and rescued the science from the imputation of being a dangerous, or at best but a visionary pursuit."

In 1809 a plan, supported by Banks, Davy, and others, was proposed by the Right Hon. Charles Greville, for making the new society an assistant association to the Royal Society. A special meeting was held at the Freemasons' Tavern, to take this proposal into consideration, when it was decided that any proposal tending to render the Geological Society dependent upon or subservient to any other society, was not in accordance with the original principles on which it was founded, and that, consequently, the propositions communicated by the Right Hon. C. Greville were inadmissible; while at the same time it was declared that the members of the Geological Society would never be called to any duties inconsistent with the obligations of those among them who were Fellows of the Royal Society, towards which elder institution the Geological Society took this opportunity of expressing its high respect and deference, and its earnest wish to contribute in any degree, and in proportion to its ability, to its welfare. "The scientific world," says Mr. Weld, "can have no reason to regret that the geologists preferred pursuing their course independently, for there is probably no society of this century that has done so much to advance its particular science as the Geological Society of London." To use the language of Herschel, "The spirit with which geology has been prosecuted for many years in our own country, has been rewarded with so rich a harvest of surprising and unexpected discoveries, and has carried the investigation of our island into such detail, as to have excited a corresponding spirit among our continental neighbours; while the same zeal which animates our countrymen on their native shore, accompanies them in their sojourns abroad, and has already begun to supply a fund of information respecting the geology of our Indian possessions, as well as of every other point where English intellect and research can penetrate." This society first held its meetings in a back room of Freemasons' Tavern, afterwards in rooms hired in the Temple, but it is now in possession of apartments in Somerset House. The annual subscription is three guineas, with an admission fee of six guineas; but a Fellow may compound for future annual contributions, that of the current year inclusive, by payment of 31*l.* 10*s.* The number of Fellows is about 875, and the time of meeting half-past eight, P.M., on alternate Wednesdays, from November to June. The affairs of the society are managed by a president, vice-presidents, and council; the president at this time is the distinguished geologist, Sir Charles Lyell, F.R.S. and L.S.

ROYAL SOCIETY OF LITERATURE,

4, ST. MARTIN'S PLACE, TRAFALGAR SQUARE.

Date of Charter, 1826.

The Royal Society of Literature originated in an accidental conversation between the late Bishop of St. David's (Dr. Burgess, afterwards Bishop of Salisbury) and an eminent person of the Royal Household, in October, 1820, respecting the various institutions which adorn the British name and nation. It was agreed that a society seemed to be wanting for the encouragement and promotion of general literature; and that if a society somewhat resembling the French Academy of *Belles Lettres* could be established, it might be productive of great advantage to the cause of knowledge. This suggestion was communicated to Sir Benjamin Bloomfield, and by him was mentioned to the King; and his Majesty having expressed his approbation, a general outline of the institution was by command submitted to the royal perusal. In November the Bishop of St. David's was summoned to Carlton House for the purpose of devising the best mode of giving effect to the undertaking, and was entrusted with a full commission to arrange the plan of the society. He accordingly invited a few of his personal friends to assist him, and for some time they held frequent conferences on the subject. Their first meeting took place on the 30th of that month, and the title proposed for the society was, "Royal Society of Literature for the Encouragement of Indigent Merit, and the Promotion of General Literature;" but at a subsequent meeting the objectionable words in this title were expunged, and the title then stood, "Royal Society for the Encouragement of Literature." In order to give signs of public life in the society, a part of the proposed plan was immediately acted on, namely, the offer of prizes for the following subjects:—

1. For the King's Premium, one hundred guineas: "On the age, writings, and genius of Homer; and on the state of religion, society, learning, and the arts during that period. Collected from the writings of Homer."

2. For the Society's Premium, fifty guineas: "Dartmoor; a poem."

3. For the Society's Premium, twenty-five guineas: "On the History of the Greek Language, and the present language of Greece, especially in the Ionian Isles; and on the difference between the ancient and modern Greek."

We may interrupt the thread of this sketch. to state that five candidates appeared within the specified time for the second premium. Two others were too late. Their productions were referred to a sub-committee of seven, and the prize was adjudged to the motto, *Come, bright Improvement;* and the poem, of which 200 copies were printed at the expense of the society, was found to be written by Felicia Hemans. The other premiums were renewed, the third being increased to fifty guineas, and another of the like sum was proposed for the best poem on "The Fall of Constantinople in the Fifteenth Century." By March, 1822, six essays were received for the Homeric premium, and ten poems on the Fall of Constantinople; but only one on the Greek Language.

Among the first members of the society were the King, two of the Royal Dukes, several of the Bishops, and many other distinguished persons. About Easter, 1821, it was deemed expedient to appoint a provisional committee, authorised to act until the society should consist of 200 members. This was accordingly done, and the sittings were continued until the 26th July. From November to April, 1822, the council continued to attend regularly to the business of the society, and enjoyed the accession of Dr. Richards, who has since bequeathed a legacy of 5000*l.* to promote the objects of the society, and other useful working members. But its proceedings were greatly paralyzed by a sinister report that his Majesty was no longer well disposed towards the society in consequence of certain written representations from Sir Walter Scott. This report might have proved a death-blow to the society, had not some of the members of the council adopted the straightforward course of ascertaining what really were his Majesty's sentiments, when the satisfactory answer was returned, that "the question had been asked of the King himself, and that his Majesty had expressly declared that no change had taken place in his sentiments of regard for the society, nor had the least unfavourable impression been made in his mind respecting it." But the season was too far advanced for much action, and the adjournment till winter took place on the 11th July. Thus the second year of the society's existence did not produce much result, and several months of the third year were equally unproductive. The opposition from some quarters was curious. "The Royal *Society* of London objected to the title, and its President, Sir Humphry Davy, must be met, argued with, and propitiated. Had that of the 'Royal *Academy* of Literature' been assumed, as was advised, the same sort of negotiation would have been necessary with Sir Thomas Lawrence! Separate plans of a constitution and regulations were propounded by Messrs. Hoare, Baber, Nares, Croly, &c., and each demanded its due share of attention; fortunately, the better parts of each were selected and condensed into one paper by Mr. Impey; but then that paper had as much revision bestowed upon it, to fit it for its desired and final purpose, as any other of the endless schemes which every new week produced. Many of the evils experienced were attributable to the irregular attendance of members of the committee and council; some being thus only partially informed of what had been agreed to in their absence. Thus, what was done at one meeting was frequently undone at the next. Now appeared a person of authority, and suggested some new feature, which, being adopted and incorporated with the results of preceding deliberations, was found on leisurely consideration to be at issue with a previous rule, or in direct contradiction to the spirit of the whole."* At length, however, the Bishop of St. David's went to work in earnest: the constitution and regulations were completed and submitted to the King on the 29th May, and on the 2nd June, 1823, were finally approved of under the sign manual. Permanence and importance were given to the society by a royal charter granted in the sixth year of George IV. in these terms:—"To our right trusty and well-beloved Thomas, by divine permission Lord Bishop of Salisbury†, and others of our loving subjects who have, under our royal patronage, formed themselves into a society for the advancement of literature, by the publication of inedited remains of ancient literature, and of such works as may be of great intrinsic value, but not of that popular character which usually claims the attention of publishers; by the promotion of discoveries in literature; by endeavouring to fix the standard, as far as practicable, and to preserve the purity of the English language by the critical improvement of English lexicography; by the reading at public meetings of interesting papers on history, philosophy, poetry, philology, and the arts, and the publication of such of those papers as shall be approved of; by the assigning of honorary rewards to works of great literary merit, and to important discoveries in literature; and by establishing a correspondence with learned men in foreign countries, for the purpose of literary inquiry and information."

Most of the important and comprehensive objects here indicated have been attempted with greater or less success, as means and opportunities have permitted. In 1828 the society adopted the publications of the Egyptian Society, and has since contributed some important researches on the antiquities of Egypt. For rewarding literary men, the royal founder enabled the society to act with princely liberality by placing at its disposal 1100 guineas a year*; to be bestowed on ten associates for life, to be elected by the officers and council, each to receive 100 guineas per annum; and the remaining 100 guineas to be expended on two gold medals, to be bestowed annually upon individuals, whose literary merits entitled them to the honour. In 1824 they were adjudged to Mitford, the historian of Greece, and to Angelo Mai, the archeologist; in 1825 to Dr. J. Rennell and Charles Wilkins; in 1826 to Professor John Schweighæuser, of Strasburg, and to Dugald Stewart; in 1827 to Scott and Southey; in 1828 to Crabbe and Archdeacon Coxe; in 1829 to Roscoe and Baron Sylvester de Sacy; in 1830 to Hallam and Washington Irving, who were thus presented with the last of the fourteen; for in 1831 George IV. died, and his successors have not continued this gratifying bequest.

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* Edinburgh Review, October, 1843.

† He had recently been translated to this see from St. David's.

The ten royal and pensioned associates were Coleridge the poet; the Rev. J. Davies, author of "Celtic Antiquities;" Dr. Jameson, the Scottish lexicographer; T. J. Mathias, author of the "Pursuits of Literature;" the Rev. J. R. Malthus, author of the celebrated work on "Population;" Mr. Millingen; Sir William Ouseley, the Persian Traveller; Mr. Roscoe; the Rev. H. J. Todd, editor and enlarger of Johnson's Dictionary; and Sharon Turner. It is much to the honour of Lord Melbourne's government, that after the death of George IV. the survivors in this list were placed on the usual pension list to the extent of their annual loss. It should also be stated, that in 1826 George IV. made a grant to the society of the crown land opposite St. Martin's Church, and that the leading and official members voluntarily subscribed 4300*l.* as a building fund with which they erected their present place of meeting. On the death of the Bishop of Salisbury, the Earl of Ripon was chosen president. A valuable library has been formed, and greatly enriched by the lexicographical and antiquarian publications presented by Mr. Todd; and by papers read at meetings and furnished by many of the most eminent writers of the age, three quarto volumes of which have been issued. The expense of many biographical works has also been supplied by the generous subscription of noblemen and gentlemen in ministerial situations, and other long-tried friends of the society.

The admission is obtained by a certificate signed by three members, and an election by ballot. Ordinary members pay three guineas on admission, and two guineas annually, or compound by a payment of twenty guineas. They are known by the initials M.R.S.L. There are also honorary associates elected by the council. These use the initial letters H.A.R.S.L. The president of this society is Sir Henry Hallam.

INSTITUTION OF CIVIL ENGINEERS, 25, GREAT GEORGE STREET, WESTMINSTER.

Established, 1818. Incorporated by Charter, 1828.

The same want of a means of intercommunion among themselves of the engineering profession as had induced the formation of the "Smeatonian Society," (see page 581,) directed to the subject the attention of some of the rising men, who were not sufficiently known to be admitted to the Club, and who at the same time felt that dining together was "not all" that was requisite for their advancement. It was moreover admitted that the Smeatonian Society was, from its constitution, of too exclusive a character to meet the wants of so large and mixed a body as had become engaged in engineering, and hence arose a general feeling that an institution on a larger scale, having for its object the furtherance of professional knowledge, might be eminently useful. Accordingly, towards the end of the year 1817, "a few gentlemen then beginning life, impressed, by what they themselves felt, with the difficulties young men had to contend with in gaining the knowledge requisite for the diversified practice of engineering, resolved to form themselves into a society for promoting a regular intercourse between persons engaged in its various branches, and thereby mutually benefiting by the interchange of individual observation and experience." The first meeting was held at the King's Head Tavern, in Cheapside, on the 2nd of January, 1818, when it was agreed to form a society under the title of the Institution of Civil Engineers.

The society thus constituted continued to assemble for two years, when, on the 23rd of January, 1820, it was resolved to elect as president a civil engineer of high standing in the profession, and Mr. Telford was requested to assume that position. He accepted the proffered chair without hesitation, and was formally installed on the 21st of March following. The influence of that great man's name and example was most favourable to the society, and on the 3rd of June, 1828, in a great degree through the instrumentality of the late Sir Robert Peel, it received a charter of incorporation under the great seal, by the title of the "Institution of Civil Engineers." The President of this rising society devoted to it much of his time and more of his thoughts; its collections were enriched by his bounty, and when, full of years and honours, he felt the close of life approaching, he endowed the institution with a munificent bequest. This legacy consisted of a large portion of his library, his professional papers and drawings, and the sum of 2000*l.*, which, by a subsequent addition from the residuary estate, has been recently raised to nearly 5000*l.*, the interest of which is to be expended in annual premiums, &c., under the direction of the council.

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* Dr. Harford, in his life of Dr. Burgess, Bishop of Salisbury (London, 1840), relates the following anecdote:—"It is a curious fact, which his Majesty, George the Fourth, himself mentioned with a smile to the present Dean of Salisbury, that the Bishop, from a misconception of his meaning at their first interview, committed the King, as an *annual* subscriber of 1000*l.*, a sum which he had intended only as a donation to the society at its outset, while his annual subscription was to have been limited to 100*l.* As, however, his Lordship, in his zeal, had immediately proclaimed the King's munificence, and fame, through the medium of the press, had almost as quickly trumpeted it with her hundred tongues throughout the country, there was no retreat, and the King not only cheerfully acquiesced, but amused himself with the incident."

The profession of the civil engineer is admirably defined in the Charter of Incorporation as "the art of directing the great sources of power in nature for the use and convenience of man, as the means of production and of traffic in states both for external and internal trade, as applied in the construction of roads, bridges, aqueducts, canals, river navigation, and docks, for internal intercourse and exchange, and in the construction of ports, harbours, moles, breakwaters, and lighthouses, and in the art of navigation by artificial power for the purposes of commerce, and in the construction and adaptation of machinery, and in the drainage of cities and towns."

The institution consists of four classes, viz., members, associates, graduates, and honorary members. Members are civil engineers by profession, or mechanical engineers of very high standing. Associates are not necessarily civil engineers by profession, but their pursuits must in some way be connected with civil engineering. Graduates are elected from the pupils of civil and mechanical engineers. Honorary members are distinguished individuals, who are enabled to assist in the prosecution of public works, or who are eminent for scientific acquirements.

The relative rates of contributions to the funds are—

	£	*s.*	*d.*		£	*s.*	*d.*
Members, Resident	4	4	0	Members, Non-resident...	3	3	0
Associates, ditto	3	3	0	Associates, ditto ...	2	12	6
Graduates, ditto	2	12	6	Graduates, ditto ...	2	2	0

The management of the institution is vested in the council, consisting of a president, four vice-presidents, two members, and two associates, who are all elected annually. The responsible officer is the secretary, who is also the resident librarian and curator, and the editor of the publications of the society.

The publication of the volumes of the Society's Transactions originated with Mr. Weale; vols. 1 and 2 were printed and published at his entire expense; in addition, he presented, free of expense to the Institution, 250 copies of volume 1, and 300 of volume 2. The Minutes of Proceedings, 8vo, are published by the Institution.

The ordinary business of the meetings, which are held every Tuesday evening from the commencement of November to the end of May, consists in the reading of papers descriptive of executed works, and of essays on scientific subjects. The distinctive feature of the proceedings is the animated discussion of the papers by the members, and by the strangers who are invited to attend.

This society, which now consists of nearly 700 members of all classes, has been extremely useful, and has given rise to several similar establishments, both in the United Kingdom and in foreign countries.

The President is William Cubitt, Esq., F.R.S.; and the Secretary, Charles Manby, Esq., F.G.S., &c.

ROYAL ASTRONOMICAL SOCIETY, SOMERSET HOUSE.

Date of Charter, 1831.

The Astronomical Society of London was established February 8, 1820, for collecting, preserving, and publishing useful observations and tables, for promoting a more attentive and minute examination of the heavens, for forming a complete catalogue of the stars and other bodies on a much more extensive scale than had ever yet been attempted, and for diffusing as widely as possible a spirit of inquiry in practical astronomy, by establishing communications with foreign observers, by circulating notices of all remarkable phenomena, and of discoveries as they arise, by comparing the merits of different artists, eminent in the construction of astronomical instruments, by proposing prizes for the improvement of particular departments, and bestowing medals or rewards on successful research in all, and, finally, by acting as far as possible in concert with every institution, both in England and abroad, whose objects have anything in common with their own; but avoiding all interference with the objects and interests of established scientific bodies.

The officers of the society consist of a president, four vice-presidents, one treasurer, and three secretaries, who, with eight other members, constitute a council for the management and direction of affairs. Candidates are to be recommended by three or more members, and balloted for. The annual general meeting takes place the second Friday in February. The annual subscription to this society is 2*l.* 2*s.*, and the entrance-money is also 2*l.* 2*s.* The society has apartments in Somerset House. Each member is styled a Fellow, and is known by the initial letters F.R.A.S. The president is Sir John F. W. Herschel, Bart.

INCORPORATED LAW SOCIETY, CHANCERY LANE*.

Date of Charter, 1831—renewed, 1845.

This Society was formed in the year 1823, for the purpose of providing a hall for the daily resort of the profession—a library, and lecture-room—fire-proof rooms for depositing deeds and papers—an office for concentrating information as to the proceedings of the different courts and other matters connected with the profession, theretofore dispersed in, and to be collected from, various offices and places—rooms for meetings of arbitrators, and other professional purposes—a club room for refreshments—and for such other objects and purposes as, in the progress of the society, might be considered desirable for the convenience and advantage of the profession.

It is a remarkable fact, that whilst the barristers had their halls and libraries, the writers to the signet in Scotland and the attorneys in Dublin their libraries and lecture rooms; and whilst the commercial and trading classes of the community also possessed places of general resort for more conveniently transacting their business; the attorneys in England, with such examples before them, should remain stationary, and be without an establishment calculated to afford such of those advantages as were suitable to their own profession.

To supply these important desiderata, the promoters issued a prospectus to their brethren, and having obtained a considerable number of subscribers, a general meeting was held on the 2nd June, 1825, when the plan was approved, and a Committee of Management appointed for carrying it into effect. It was deemed necessary to raise 50,000*l.* in shares of 25*l.* each, with power to increase the capital to 75,000*l.*

In 1827, a large proportion of the fund having been collected, and a deed of settlement signed by the members, the committee obtained an eligible site, contiguous to the inns of court and law-offices, and the present building was erected thereon.

A Royal Charter of Incorporation was granted on the 22nd December, 1831, and the institution was opened for the use of the members on the 4th July, 1832.

In the progress of the several useful purposes contemplated by deed of settlement and original charter, the committee of management experienced considerable disadvantages occasioned by the joint-stock character of their undertaking. To obviate this objection, the committee, with the sanction of the then proprietary body, were authorised to apply for a new charter, of a general and collegiate nature, and to surrender the existing charter; in the prosecution of which objects, the committee were gratified by a liberal renunciation, on the part of a large majority of the proprietors, of their individual and transferable shares in the property and effects of the institution.

A new charter was accordingly granted by her present Majesty, on the 26th February, 1845, by the tenor of which, the constitution of the society has been so modified that the individual rights and responsibilities of the members, as proprietors of the former institution, have become merged in the corporation, and the whole capital and possessions, rents and income, are rendered applicable to the general purposes of the society "in promoting professional improvement, and facilitating the acquisition of legal knowledge."

By the 6 & 7 Vict. c. 73, the society is appointed registrar of attorneys and solicitors, and the Commissioners of Stamps are directed not to grant any certificate until the registrar has certified that the person applying is entitled thereto. Under this act, an alphabetical book is kept by the society of all attorneys and solicitors on the rolls of the several courts of law and equity. An annual book is also kept of all applications for the registrar's certificate, with the name of the court in which each attorney was admitted, and the date of admission; which book is open for inspection without fee.

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* This account is taken from a statement published by the society, entitled "Origin and Objects of the Society," prefixed to the Annual Report.

The judges of the common-law courts, under the general rules and orders of court, annually appoint sixteen members of the council, with the masters of the several courts of law, as examiners of all persons applying to be admitted on the roll of attorneys; and the Master of the Rolls also appoints annually twelve members of the council for the like purpose in regard to solicitors.

The society has for upwards of seventeen years pursued a course of progressive usefulness, productive of essential and increasing advantage to the profession, resulting from the exertions of a recognised body of practitioners, anxious to co-operate in promoting every measure calculated to afford facilities for professional practice, to remedy abuses, and to sustain the just claim of their branch of the profession to the respect of the community at large. In furtherance of these desirable objects, the council and their different committees hold regular meetings for conducting the general business of the society. They cause lists of persons applying to be admitted and re-admitted attorneys and solicitors, with applications for taking out or renewing certificates, to be printed and distributed among the members and in the several law offices, and transmitted to the Provincial Law Societies, in order that improper persons may be opposed. Where there is sufficient ground for opposition, the council undertake it on behalf of the society, and they also apply to the courts to have persons struck off the rolls who misconduct themselves as attorneys.

They cause to be printed and distributed amongst the members all new rules of court, and other important professional information.

On their opinion being required as to any doubtful or disputed professional usage, they carefully consider the matter, and register their decisions in a book kept for that purpose, which is accessible to the members of the society.

They examine all bills brought into parliament which relate to the law, and state in the proper quarter such objections as occur to them, and also suggest such additions and alterations as appear to them necessary for improving and perfecting the proposed enactments; and in these and the like instances they take all such measures as seem best calculated to promote the general interests and respectability of the profession.

Any gentleman duly qualified according to the charter may be admitted a member, on being proposed by two members of the society, and approved by the council, and paying, if a town member, an admission fee of 15*l.*, and an annual subscription of 2*l.*, or if a country member, 10*l.* on admission, and 1*l.* annually *.

Every member immediately on his admission becomes entitled to the benefits resulting from the institution, which comprises the following departments:—

THE HALL, open daily, from 9 o'clock in the morning till 10 at night, furnished with suitable accommodations for transacting business, with the votes and proceedings of both Houses of Parliament, the London Gazette, morning and evening newspapers, reviews, and other useful periodical publications.

Here also members of the profession are enabled to meet one another by appointment from distant parts of the town or country for all purposes of business, and to employ the intervals of engagements profitably as well as agreeably.

AN ANTE-ROOM AND REGISTRY OFFICE, for the use of members and their clerks, open daily from 9 o'clock in the morning until 8 at night.

In the Registry Office are kept an account of appeals in the House of Lords, the general and daily cause papers, seal papers, lists of petitions in causes in the courts of equity, and in lunacy and bankruptcy, the sittings papers, peremptory papers, special papers, and papers of new trials in the courts of law; with a statement of the business intended to be proceeded in on the following day, as far as practicable; and the earliest information of the arrangements made by the judges for the dispatch of business.

Boxes with locks are provided in the ante-room for members, in which they may deposit their papers; thus saving the trouble and expense of carrying them to and from the courts and offices. Books are also kept for entering particulars of property to be sold or purchased; of money to be lent, or wanted to be borrowed on mortgage or otherwise; of applications for partners, and for articled, managing, and other clerks.

A SUITE OF ROOMS, for meetings of arbitrators, or on any other professional matter.

Experience has proved this part of the institution to be a great convenience to the profession. In these rooms, also, business which cannot be conveniently done in the hall may be transacted, and appointments made with clients and others.

FIRE-PROOF ROOMS AND CLOSETS, for the deposit of deeds, &c., in separate boxes, or to be let to members of the profession, either for temporary or permanent purposes; each renter having a private key of his own room or closet, to which no other person has access; while all the rooms are secured by a principal outer door, of which the Secretary alone has the key.

A LIBRARY, which is open daily, from 9 o'clock in the morning until 10 at night, except on Saturdays, when it is closed at 4. It comprises a large collection of books relating to the law, and to those branches of science or literature which may be considered as more particularly connected with the profession; such as reports of proceedings in the several courts of law and equity, local and private acts, journals, and other proceedings of Parliament; county, local, and general histories; with heraldic publications, and other matters of antiquarian research, &c. Upwards of 9400 volumes have been already collected, including the statutes at large, most of the text-books, a complete set of all the reports both in law and equity, a great body of county history, and of topographical and antiquarian works, all the volumes printed by the commissioners on the public records of the kingdom, and the London Gazette from its commencement.

In case any scarce book in the library should be wanted for production in any of the courts of London or Westminster, the librarian, or a messenger, will attend with it, under the authority of the president or vice-president, or two members of the council.

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* A proportion of the annual subscription is required according to the time of admission.

To enable clerks the better to qualify themselves for examination previously to admission, the articled clerks of members are admitted to the library on payment of an annual subscription of 1*l*.

The advantages of such a library may be appreciated on considering the great expense attending the purchase of such books as are absolutely necessary to an attorney or solicitor for constant use; whilst the possession of a comprehensive law library, particularly if it include parliamentary publications, county histories, antiquities, &c., is scarcely within the compass of any individual, not only on account of the expense, but also of the want of room.

Lectures on the different branches of the law are regularly delivered in the hall, and are numerously attended by the articled clerks of members, and other students; and members themselves have found them particularly useful, in consequence of the various and extensive alterations which have already taken place, and are still in progress, as well in principle as in practice, both in law and equity.

The members of the society are entitled to attend these lectures gratis; while to others the expense is very moderate, being 1*l*. for each set of lectures, or 2*l*. for the whole course to persons under articles of clerkship to members, or persons who have served such clerkship, while they continue clerks to members, and are not practising on their own account. The articled clerks or gentlemen not members pay 1*l*. 10*s* for each set, or 3*l*. for the whole; and other students are admitted on paying 2*l*. for each set of lectures, or 4*l*. for the whole course. The lectures are delivered at 8 o'clock in the evening, so as to interfere as little as possible with the business of the day.

Club Room.—There is a club, consisting only of members of the society who have paid entrance fees and annual subscriptions; and any other members of the society may become members on being proposed, balloted for, and elected, and on payment of the entrance fee of five guineas, and an annual subscription of five guineas for town members, and three guineas for country members *.

The members of the club, besides other advantages, are supplied with dinners and refreshments on the plan of the University, Athenæum, United Service, and similar clubs.

MEDICAL AND CHIRURGICAL SOCIETY, 53, BERNERS STREET, OXFORD STREET.

Date of Charter, 1834.

The Royal Medical and Chirurgical Society was instituted in 1805, and incorporated in 1834, for the cultivation and promotion of medicine and surgery, and of the branches of science connected therewith. The members are styled Fellows, and are resident, non-resident, honorary, and foreign honorary. The meetings are held at the society's apartments, 53, Berners Street, Oxford Street, where there is a good library of about 20,000 volumes, the use of which is restricted to resident fellows. Candidates are recommended by three members, and elected by a majority of four-fifths. The fees are six guineas entrance, and three guineas annually from all who are resident, or within seven miles of the General Post Office.

ROYAL INSTITUTE OF BRITISH ARCHITECTS, 16, GROSVENOR STREET, BOND STREET.

Date of Charter, 1837.

The Royal Institute of British Architects was founded in 1835, for facilitating the acquirement of architectural knowledge, for the promotion of the different sciences connected with it, and for establishing a uniformity and respectability of practice in the profession. Its members consist of, 1st, Fellows—architects who have been engaged as principals for at least seven successive years in the practice of civil architecture; 2nd, Associates—persons engaged in the study of civil architecture, or in practice less than seven years, and who have attained the age of 21—these have no vote; 3rd, Honorary Fellows—noblemen or gentlemen unconnected with any branch of building as a profession, and contributors of not less than twenty-five guineas. Eminent men, foreign or English, may also be elected honorary members, without contribution. The Fellows pay five guineas admission, and three guineas annually; the Associates three guineas the first year, and two guineas each year afterwards. The chief objects of the society are the formation of a library of works, manuscripts, and drawings, illustrative, practically and theoretically, of the art, the publication of curious and interesting communications, the collection of a museum of antiquities, models, casts, &c., with provision for performing experiments on the nature and properties of building materials. The usual forms are observed of recommendation by three members, and election by ballot, a majority of four-fifths being required. Meetings are held at eight o'clock on alternate Monday evenings, from the first Monday in November until the last in June; Christmas, Passion, and Easter weeks excepted. The annual general meeting is held on the first Monday in May.

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* If admitted after June, the subscription for the remainder of the year is three guineas for town, and two guineas for country members.

SIR JOHN SOANE'S MUSEUM, 13, LINCOLN'S INN FIELDS.

Sir John Soane presents one of those instances, so frequent in this country, of an individual rising by his own talent and energy from a humble position in society to one of considerable wealth and influence. He was the son of a bricklayer at Reading, in Berkshire, but displaying an early love for architecture, he became a student of the Royal Academy, where in 1772 he won the silver medal, and afterwards the gold medal, for his drawings and designs. The academy pension of 60*l.* per annum was then conferred upon him, that he might prosecute his studies in Rome. He appears to have diligently improved this privilege, for, a few years after his return from thence, he was elected architect and surveyor to the Bank of England. From this time appointments and honours came thickly upon him. He was appointed clerk of the works at St. James's Palace, architect to the Board for managing the Woods and Forests, and architect generally to the Houses of Parliament and public buildings. Subsequently he was elected Professor of Architecture to the Royal Academy, and in 1831 he received the honour of knighthood.

Without following his career as an architect, we may notice that, a few years before his death, he retired from his profession, and devoted himself to the completion of his house in Lincoln's Inn Fields, and the arrangement of the museum, which at much cost and trouble he had collected there. He also obtained an act of parliament for settling and preserving the house and museum, for the benefit of the public. The act came into operation in 1837, when the decease of Sir John Soane took place (Jan. 20), and from that time the trustees appointed by the act proceeded to carry into effect the will of the founder. They and their successors had full power given them at all times to inspect and exercise due control over "the museum, library, books, prints, manuscripts, drawings, maps, models, plans, and works of art, and the houses and offices in which the same are deposited," providing for their due preservation, and for the free admission of visitors (among whom are particularly specified amateurs and students in painting, sculpture, and architecture), on at least two days in every week throughout the months of April, May, and June. The museum is therefore kept open to general visitors on Thursdays and Fridays during the three months above named, and likewise on Tuesdays, from the first in February to the last in August, for the accommodation of foreigners and other persons making a short stay in London, or who cannot, from special circumstances, avail themselves of the ordinary opportunities of visiting the collection.

Cards of admission are obtained, by application, a day or two beforehand, either to a trustee, or by letter to the curator, or personally at the museum. In the latter case the applicant must leave the name and address of the party desiring admission, and the number of the persons proposed to be introduced, when, unless there is some reason to the contrary, the curator forwards by post a card of admission for the next open day. Access to books, drawings, manuscripts, and permission to copy pictures and other works of art, is also granted on special application to the trustees, or the curator, George Bailey, Esq., who resides at the museum.

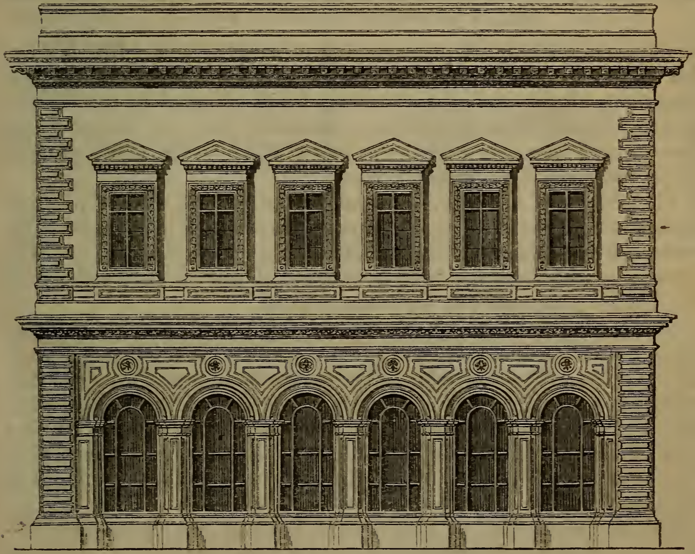
In entering Sir John Soane's Museum, the visitor cannot fail to be struck with the multiplicity of the objects, and the ingenious contrivances by which a house of very moderate size has been made to contain so large an amount of curiosities and works of art, without altogether destroying its character as a private residence. It seems to have been the aim of the owner to show how much could be done within confined limits; but although we must admire his skill and ingenuity, yet we should be sorry to hold up to imitation his plan of crowding every available space, every recess, lobby, staircase, courtyard, wall space, and ceiling, with paintings, busts, statues, medals, vases, fragments of sculptures, bronzes, &c.; and taking the visitor by surprise, by a cunning arrangement of mirrors, by which a great reduplication of objects, and an apparent increase of space, is obtained. The entrance hall of the house is decorated with casts in plaster, after the antique, medallion reliefs, and other sculptures, and the door leading to the staircase has some fine specimens of ancient painted glass. The dining room and library, opening into each other, have their walls of deep vermilion colour, with numerous busts, bronzes, vases, &c., on pedestals or on the book-cases; and over the chimney-piece, a fine portrait of Sir John Soane, by Sir Thomas Lawrence, P.R.A., almost the last picture painted by that distinguished artist. The library chairs are of a curious design, and richly inlaid with mother-of-pearl. There is also an interesting pedestal table of walnut tree, which formerly belonged to Sir Robert Walpole. The ceilings are painted by Howard, R.A. From these rooms we enter the little study, which is full of marble fragments of antiquity, and other curious objects, and leads to the dressing-room and recess, which gives a view from its east window of what Sir John called the Monk's Yard, a collection of gothic fragments arranged like a ruined cloister, and from its west window of the Monument Court, containing architectural groups of various forms and nations. The room itself, and the corridor adjoining, are full of curiosities, but the most interesting objects are two engravings by Hogarth. From this corridor you enter the student's room, containing wooden models, &c.; and the picture-room, lighted from the top, and having, as it were, double walls, or at least moveable planes, so that after you have examined, as you think, the whole contents of the room, the side wall or shutter is turned on its hinges, and two fresh surfaces are displayed. This room is exceedingly rich in the possession of two series of paintings, by Hogarth—the Rake's Progress and the Election, making in all, twelve paintings. The first series, of eight pictures, was purchased for 570 guineas; the last, of four pictures, for 1650 guineas.

The lower part of the museum contains corridor, ante-room, catacombs, &c., and what is called the sepulchral chamber, rendered peculiarly interesting by containing the beautiful alabaster sarcophagus brought from Egypt by Belzoni. The breakfast-room, on the ground floor, has some interesting pictures and busts, especially a portrait of Napoleon, in his 28th year, painted for Josephine, afterwards Empress, by Goma, a Venetian artist, and valued by her as an excellent likeness. Passing up the staircase, which is elaborately adorned, you enter the drawing-rooms, which are cheerful, well lighted, and elegant rooms, with good paintings and models, an ivory table, and chairs, from Tippoo Saib's palace, and other interesting objects. We cannot particularly describe the upper floor, but a good guide to the whole is sold at the museum, being chiefly abridged from Sir John Soane's own account of the house and museum.

MUSEUM OF PRACTICAL GEOLOGY, JERMYN STREET, ST. JAMES'S*.

This national establishment has arisen from suggestions made by Sir Henry De la Beche, C.B., to the Chancellor of the Exchequer, in 1835, that advantage might be taken of the opportunities constantly afforded in the progress of the geological survey of the United Kingdom, under his direction, of collecting geological and mineralogical specimens, in illustration of the practical applications of geology, and exemplification of the mineral productions of this country.

The design was approved of, and it has, since 1837, been extensively carried out. The collections, until very lately, were placed in a house in Craig's Court; but in number and importance they outgrew the accommodation there afforded, and the present elegant and



MUSEUM OF PRACTICAL GEOLOGY.

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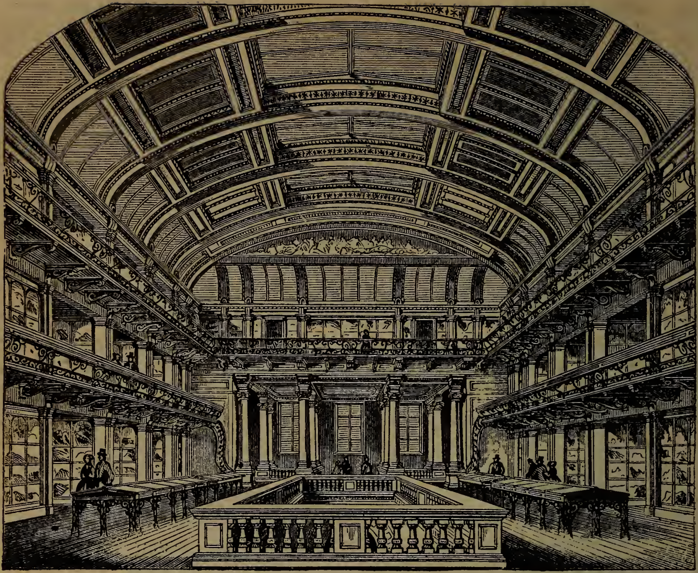
* This notice has been contributed by Robert Hunt, Esq., keeper of Mining Records in the museum.



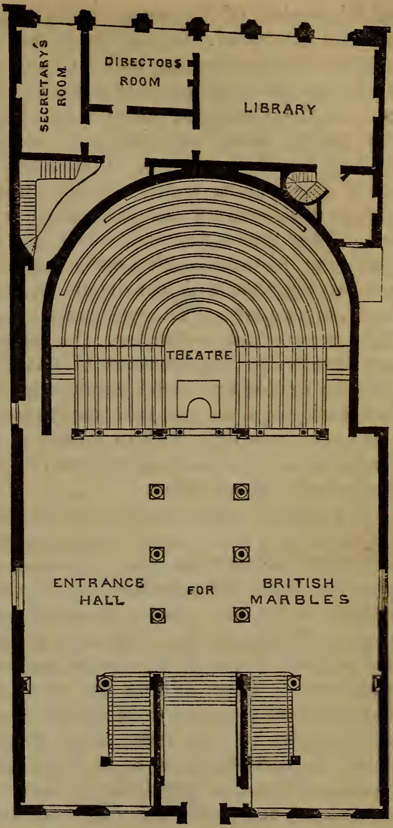
HALL OF THE MUSEUM OF PRACTICAL GEOLOGY.

commodious building has been erected to receive them. One front of this museum (shown in the previous page) is in Piccadilly, the apartments at this end of the building being occupied by the library, palæontological office, model-room, laboratory, and the offices of the director and secretary; the other front, which is the chief entrance to the museum, is in Jermyn Street.

The objects of this establishment are to exhibit all the practical applications, in the most extended sense, which have been made of the geological and mineralogical formations of the United Kingdom. The manner in which this has been accomplished will be understood from the following summary of the arrangements.

On entering from Jermyn Street, we find a very spacious hall (see above), which is devoted to the exhibition of all the building and ornamental stones of these islands. In the cases around the hall will be found specimens, in six-inch cubes, of most of the sandstones, oolites, limestones, granites, and porphyries, which this country produces. With a view of showing in the best form the various ornamental stones, they have to some extent been employed in the decorations of the hall. The entrance is lined with the alabaster of Derbyshire. There are pilasters around the hall, of granite from Scotland, serpentine from Ireland, and beautiful limestones from Devonshire, Derbyshire, and other districts. On one side will be found a very elaborate screen, the pilasters and cornice of the Cornish serpentine, and the panels of the Irish serpentine, framed with the productions of Derbyshire, which are themselves very fine specimens of inlaying. There is also in this hall a very large copy of an Etruscan vase, cut in the Aberdeen granite. In the centre is a tessellated pavement, formed from the Cornish China clay by Prosser's process of compression, and manufactured by Messrs. Minton, and around this will be found a paving of encaustic tiles. Numerous pedestals in different stones stand around the hall, showing in themselves the variety of marbles which Great Britain and Ireland produce, which support specimens of marble vases, statuettes in artificial stone, cement, &c.

Ascending by a handsome staircase, at the sides of which specimens of British industrial art are placed, the principal floor of the museum is reached (see plan). This apartment is of the following dimensions:—95 ft. long, 55 ft. wide, 32 ft. high to the springing of the roof, and 42 ft. 9 in. in the centre. The roof of this is of iron, and the arrangements for the admission of light are exceedingly good. It is glazed with rough plate glass, the panes being each 10 ft. by 3 ft. 4 in., and $\frac{3}{8}$ in. thick. Around this room run two light galleries, so that there are three tiers of glass cases, and upon the balustrade of the galleries are horizontal glass cases, which are devoted to the exhibition of British fossils. In these cases will be found specimens of the earliest forms of organization which have yet been discovered in this country, and the series is continued in regular order up to the most recent fossils of the tertiary formations.



GROUND PLAN OF MUSEUM OF PRACTICAL GEOLOGY.

In this museum will be found an interesting and complete series of the earthenware and porcelain of Staffordshire, from the first establishment of any works in the potteries. The fictile wares of Derby, of Worcester, of Swansea, of Chelsea, of Bow, and other districts, are also illustrated. In addition to this series, representing an important British manufacture, will be found specimens of the earthenware of the ancients, the keramic manufactures of Italy, Germany, France, and of the Orientals, for the purpose of showing to what extent our potters have been indebted to the works of other times and nations for their success. Connected with this series, the various china clays, china stone, and the other raw materials employed in making earthenware and porcelain, are exhibited. In the same manner, all the native materials which are employed in the formation of glass,—an historical series, consisting of beads, bottles, jugs, and other articles, together with specimens of modern European manufacture, have here a place. The specimens of old Venetian glass are exceedingly curious and instructive. In connection with glass, several cases are devoted to the processes of enamelling, in which silica and the metallic oxides are alone employed. Many of the enamels are of high antiquity: several fine specimens of the Limoge enamel, and some very excellent modern works in this style of art, together, for comparison, with many specimens of Chinese enamels, will be found well worthy of attention.

The mineral collection is extensive, and contains specimens of every variety of ore which is of use in the arts or manufactures. In this important department, the following admirable method has been adopted:—All the minerals are, in the first place, arranged in systematic order, the locality in which each specimen is found being given. Masses of the lode, and portions of the rock, of sufficient size to show the mode of occurrence in nature, accompany the selected specimens. Then follows the mode of dressing the ores for the market; then illustrations of the smelting processes in all their details, and samples of the varieties of metals produced. Manufactured articles succeed these, so as to show whether they are employed for useful purposes, or purely for ornamental ends, the character of the pure metal, and its alloys. Thus statuettes of copper, tin, zinc, lead, iron, brass, bronze, and other metals, will be found; and in this department the electrotype deposits have a place, and electro-plating and gilding are fully illustrated.

An adjoining room and a portion of the gallery are devoted to models of mining machinery, of mines, and collections of miners' tools. Complete models of the Cornish pumping engine (Taylor's engine at the United Mines), of the water-pressure engine at Alston Moor, of the turbine and other wheels, and a beautiful set of all the varieties of valves used in those hydraulic engines, will be found in this department. Here is also a sectional model of Dolcoath Mine, a model of the coal districts of South Wales, of Dean Forest, and of the lead district of Nentsbury—all of them capable of dissection, so that the geological character may be fully exemplified, and the modes of working shown. A model of the machine employed in

Cornwall for raising and lowering the miners, models of stamping and crushing engines, and a set to illustrate the processes of iron-smelting by the hot and cold blast, well deserve attention. The tools of the Cornish, the German, the Russian, and the Mexican miners, are here. Every variety of the safety-lamp, chains, wire-ropes, and all the material used in mining operations, are exhibited, so that this department furnishes the means of education which is so much required in a great mining country like Great Britain.

Among the illustrations, few will be found to the practical inquirer more instructive than the iron series. The ore from the mine in all its varieties, the results of each stage of the processes of smelting, and the slags obtained in these processes, pig and bar iron, illustrations of fibrous and crystalline varieties of iron, and of the ductility, tenacity, and strength of specimens, the manufacture of steel, the production of cutlery in sword-blades and knives, and of the steel dies for striking coins and medals, together with the mixtures of iron and steel as seen in the turned gun-barrels; and the ornamental castings in iron of Colebrook Dale and other places, are severally found in systematic arrangement.

Our limited space prevents our detailing more completely the various points of high interest and of practical importance which belong to this museum. We must, however, notice, that the history of the metals is told, in collections of bronzes and brasses, and gold and silver ornaments. This portion is necessarily imperfect at present, but it even now furnishes a valuable lesson, and we doubt not but important additions will be rapidly made to its stores.

Connected with this museum is the Mining Records Office, established in 1839, in which are preserved the plans and sections of the mines of the United Kingdom. The importance of collecting these documents was strongly impressed upon the Treasury by a committee of the British Association. Although there is no compulsory regulation to secure copies of the mining plans and sections, but the whole is left to the will of the mine proprietor, a very extensive series of drawings has been collected together, and much important statistical information accumulated. A well-fitted laboratory for carrying out chemical investigations on all matters which are in any way connected with the objects of the institution, and a commodious theatre, in which lectures on the practical application of science will be delivered, are the only other features we can notice.

The following officers are connected with this establishment:—

Sir Henry De la Beche, C.B., Director General.
Professor Ramsay, F.R.S., Local Director of the Geological Survey.
Richard Phillips, Esq., F.R.S., Curator and Chemist.
Dr. Lyon Playfair, F.R.S., Chemist.
Professor Edward Forbes, F.R.S., Palæontologist.
Warington W. Smith, Esq., M.A., Mining Geologist.
Trenham Reeks, Esq., Secretary and Librarian.
Robert Hunt, Esq., Keeper of Mining Records.

ROYAL BOTANIC SOCIETY, REGENT'S PARK.

Date of Charter, 1839.

The Royal Botanic Society, whose gardens occupy the inner circle, Regent's Park, was founded and incorporated in 1839, for the promotion of botany in all its branches. The gardens of this society are well laid out, and rendered exceedingly attractive by the exhibitions and promenades held therein. In May, June, and July, there are splendid floral exhibitions, when nearly three hundred medals are distributed, bearing value from fifteen shillings up to twenty pounds. The society's beautiful gardens occupy about eighteen acres of ground, and contain a spacious and elegant conservatory, capable of accommodating two thousand visitors. The annual subscription to this society is two guineas, the entrance fee five guineas. The subscription may be compounded for by the payment of twenty guineas. Every candidate for admission as a fellow or member, must be proposed by three members, and admitted by ballot. The annual general meeting is on the 10th of August; the ordinary meetings are held on the second and fourth Saturdays of each month, at a quarter before four o'clock. About one thousand pounds is annually spent by the society in the encouragement and growth of plants. The president of this society is the Duke of Norfolk; the secretary is J. De Carle Sowerby, Esq., whose residence is on the society's grounds; and the treasurer, Edward Majoribanks, Esq.

PHARMACEUTICAL SOCIETY, 17, BLOOMSBURY SQUARE.

Date of Charter, 1843.

The Pharmaceutical Society of Great Britain was instituted "for the purpose of uniting the chemists and druggists into one ostensible, recognised, and independent body for protecting their general interests, and for the advancement of pharmacy, by furnishing such an uniform system of education as shall secure to the profession and to the public the safest and most efficient administration of medicine." A royal charter of incorporation was granted in 1843, in which, in addition to the above, the objects of the society were declared to include the providing a fund for the relief of distressed members and associates, and of their widows and orphans.

This society has established a board of examiners, whose duty it is to see that persons desirous of becoming members are possessed of the necessary qualifications. Each person approved by them, pays an admission fee of two guineas, with an annual subscription of a guinea and a half. Foreigners, or our own colonists, are admitted as life members, on the payment of ten guineas. Associates, registered apprentices, and students, being assistants to chemists and druggists, are admitted, after due examination, by paying an annual subscription of ten shillings and sixpence.

The society has a library, an excellent museum, and a laboratory, for the superintendence and preservation of which a separate committee of four or more members of council is appointed. Lectures are delivered, and meetings are held at the society's house, in Bloomsbury Square, the second and fourth Wednesdays in each month. The annual general meeting is on the third Tuesday in May. Members sometimes use initial letters, in which case they are M.P.S., A.P.S., and R.A.P.S. The Pharmaceutical Journal is published in monthly shilling numbers.

SOCIETY OF ARTS, JOHN STREET, ADELPHI.

Date of Charter, 1847.

The Society of Arts has for its object the encouragement of the arts, manufactures, and commerce of this country, by means of exhibitions and meetings, and by bestowing honorary rewards for works of merit, inventions, discoveries, and improvements. This society was founded in 1753, but it is only during the last seven years that it has attained to the prosperity which its efforts deserve. A great impulse has been given to its proceedings by the patronage of His Royal Highness Prince Albert, and by the bestowal of a royal charter of incorporation in 1847, in which the Prince Consort was declared the first president. Within the last seven years the income of the society has increased from 800*l.* to 1600*l.*, the whole of which is expended in the promotion of arts, manufactures, and commerce. To effect this object committees are appointed to consider the various communications received, and to recommend their adoption or rejection by the council. This society not only holds out rewards for the encouragement of fine arts and manufactures, but for improvements in agriculture, chemistry, mechanics, &c.; and we are assured that, in carrying out its various objects, the society has expended a sum of not less than 100,000*l.*, raised by the subscriptions of members, and by donations and legacies.

Members are elected by ballot in the usual way, but pay no admission fee. The annual subscription is two guineas, or a composition of twenty. The meetings are held at the society's house, John Street, Adelphi, on Wednesday evenings, during November, December, February, March, May, and June. In the last-named month the anniversary is held, and rewards are distributed by the president. The published Transactions of the society form an old and new series, amounting to 55 or 56 volumes.

SOCIETIES WITHOUT CHARTERS,

In the order of the Dates of their Foundation.

SMEATONIAN SOCIETY OF CIVIL ENGINEERS, FREEMASONS' TAVERN, GREAT QUEEN STREET, LINCOLN'S INN FIELDS.

THE profession of the Civil Engineer is of comparatively modern origin; for it is only among a people very considerably advanced in civilization and wealth that works can be prosecuted on an extensive scale with success. The formation of the factory system by Arkwright, of inland navigation by Brindley, of lighthouses and harbours by Smeaton, and the undertaking of great works at the public expense, gradually raised into importance "a self-created set of men, whose profession owes its origin, not to power or influence, but to the best of all protection, the encouragement of a great and powerful nation; a nation become so from the industry and steadiness of its manufacturing workmen, and their superior knowledge in practical chemistry, mechanics, natural philosophy, and other useful accomplishments." The first society of civil engineers was established under the auspices of the illustrious Smeaton, in 1771. Before that period men engaged in public works "often met accidentally in the Houses of Parliament, and in courts of justice, each maintaining the propriety of his own designs, without knowing much of each other. It was, however, proposed by one gentleman to Mr. Smeaton, that such a state of the profession, then crude and in its infancy, was improper; and that it would be well if some sort of occasional meeting in a friendly way was to be held, where they might shake hands together and be personally known to each other; that thus the sharp edges of their minds might be rubbed off as it were by a closer communication of ideas, no ways naturally hostile; might promote the true end of the public business upon which they should happen to meet in the course of their employment, without jostling one another with rudeness, too common in the unworthy part of the advocates of the law, whose interest it might be to push them on perhaps too far in discussing points in contest." It appears that Smeaton acted at once on this idea. In March, 1771, a small meeting was first established on Friday evenings, at the Queen's Head Tavern, Holborn. The members at first were few, but in the course of 20 years they amounted to upwards of 65; but of these there were only 15 who were real engineers. "Conversation, argument, and a social communication of ideas and knowledge in the particular walks of each member, were at the same time the amusement and the business of the meetings." This society, or rather club, continued its meetings until May, 1792, when, in consequence of some misunderstanding among its members, it was dissolved by consent. Steps were then taken to reorganise the society, and Smeaton consented to become a member; but he died before the first meeting, which was held at the Crown and Anchor in the Strand, on the 15th April, 1793, under the title of "The Society of Civil Engineers." The constitution agreed on was that there should be three classes of members:—the first to consist of real engineers; the second class, men of science and gentlemen who had studied civil engineering; and the third class, artists and others connected with the profession. The members were to dine together every other Friday during the session of parliament. It is stated as a mark of the society's regard, "that a tribute was always paid after dinner to the memory of their late worthy brother, John Smeaton."

The society having been informed that Sir Joseph Banks had purchased all the manuscripts, designs, &c., of Smeaton from his representatives, proposed to publish such of them as consisted of reports on public works. This was acceded to, and in February, 1795, a special committee was formed, with Sir Joseph Banks at its head, to superintend the publication. The first volume was published in 1812, from the preface to which the above particulars are derived. Three other volumes were subsequently published.

The society thus established continues to exist under the name of the "Smeatonian Society of Civil Engineers." It meets, for the purpose of dining, monthly during the session of parliament, at the Freemasons' Tavern, and includes some of the most eminent men in the profession.

MEDICAL SOCIETY, BOLT COURT, FLEET STREET.

The Medical Society of London was instituted in 1773, and holds its meetings at a house in Bolt Court, Fleet Street, which was bequeathed to it, together with a considerable library, by Dr. Lettsom, a celebrated physician of former days. Three medals are awarded annually for the promotion of medical science—a gold one, called the Fothergillian, and two silver ones. The meetings are held every Monday evening at eight o'clock, from September to May, with the exception of two or three weeks at Christmas. The Transactions of the society have been published at irregular intervals. Fellows are elected by ballot. They pay one guinea entrance, and one guinea annual subscription.

LONDON INSTITUTION.

The London Institution originated in the praiseworthy and energetic efforts of several of the principal bankers and merchants in the city. The first public meeting was held, May 23, 1805; Sir Francis Baring, Bart., M.P., in the chair. It was then resolved on to establish an institution upon an extensive and liberal scale, in some central part of the city, the object of which shall be to provide—

1. A library, to contain works of intrinsic value.
2. Lectures for the diffusion of useful knowledge.
3. Reading rooms for the daily papers, periodicals, pamphlets, and foreign publications.

The subscriptions for this purpose proceeded with unexampled rapidity, so that in the short space of one week they reached nearly sixty thousand pounds. It was not till the beginning of the following year that the business of the institution actually commeneed in a temporary establishment in the Old Jewry. A library of 10,000 volumes was here arranged in five spacious apartments, but the intended scientific lectures were deferred until preparations could be fully entered into for making them at once respectable and useful. The society removed, in 1812, to other premises in King's Arms Yard, Coleman Street; but it was not till 1815 that they were able to carry out their original intention of purchasing a site, and commencing a building of their own. In 1815 the present house of the institution, which is a handsome building, in the centre of the north side of Finsbury Circus, was commenced, and in 1819 it was opened to the members. The first course of scientific lectures was now delivered, by Professor Brande, secretary to the Royal Society, and these were followed in succeeding seasons by regular courses on the various branches of science and the useful arts, on music, the fine arts, and literature.

The library of this institution has been collected at vast expense and with great care. It consists of upwards of 60,000 volumes, and is very rich in topographical works. Professor Porson, the first librarian, died in the rooms of the institution, in 1808. The library is open from 10 A.M. to 11 P.M., every day except Saturday and Sunday. On Saturday it closes at 3. The soirées or evening conversazioni of the institution are held during the spring season. On these occasions the library is copiously furnished with models and specimens of new inventions, for the amusement of visitors, and a lecture is also delivered in the theatre.

The institution consists of a limited number of proprietors, and of life and annual subscribers. The affairs are managed by a president, four vice-presidents, and twenty managers. There is also a board of visitors, and there are five auditors of accounts.

ROYAL ASIATIC SOCIETY, 5, NEW BURLINGTON STREET.

The Royal Asiatic Society of Great Britain and Ireland was founded in 1823, for the investigation and encouragement of arts, science, and literature, in relation to Asia. The meetings are held at 5, New Burlington Street, where there is a library and museum, the latter containing a collection of oriental arms and armour, and other objects of interest. The museum is open daily for the admission of the public (except on Saturdays, and the usual holidays), between the hours of eleven and four, at the recommendation of members, who are furnished with tickets for distribution. The meetings of the society are held the first and third Saturdays of every month, from November to June. The publications of this society are its "Transactions" and "Journal," the former in quarto, the latter in octavo volumes. These contain important researches and information on Eastern literature and science. The library of this society is rich in oriental manuscripts and Chinese books. The principal members are noblemen and gentlemen who have some especial interest in or connection with our Eastern possessions, or who take an interest in the wide field of inquiry opened to us by recent events with relation to China.

The members of this society are resident, non-resident, honorary, foreign, and corresponding. All resident members (namely, such as usually reside in Great Britain and Ireland), pay an admission fee of five guineas, and an annual subscription of three guineas. Non-resident members do not pay the annual subscription. The mode of admission is by the recommendation of from three to five members, and three-fourths of the votes are necessary.

The following societies are branch societies of the Royal Asiatic Society, and their members, when in England, have free admission to its meetings:—the Literary Society of Bombay; the Literary Society of Madras; the Asiatic Society of Ceylon; the Asiatic Society of China, at Hong Kong.

ZOOLOGICAL SOCIETY, 11, HANOVER SQUARE.

The Zoological Society of London was instituted in 1826, under the auspices of Sir Humphry Davy, Sir Stamford Raffles, and other eminent individuals, for the advancement of zoology, and the introduction and exhibition of subjects of the animal kingdom, alive or in a state of preservation.

The affairs of the society are managed by a president, vice-presidents, and council.

The presidents of the Royal Society, of the Linnean, Geological, and Horticultural Societies, of the Royal Institution, and of the Royal Colleges of Physicians and of Surgeons, and the chairman of the Hudson's Bay Company, for the time being, are *ex officio* honorary members of the society.

Fellows of this society pay an admission fee of five pounds, and an annual contribution of three pounds, or a composition of thirty pounds in lieu thereof. Annual subscribers pay a contribution of three pounds on the 1st of January in every year. Honorary, foreign, and corresponding members pay no contribution.

Fellows have personal admission to the gardens and museum with two companions daily. They receive also twenty tickets annually for the admission of friends at any time, and on Saturdays and Sundays they have the power of admitting two friends, by written order, instead of by their personal introduction. Annual subscribers have similar privileges, but can only admit one companion, or on Saturday and Sunday one friend by written order. The wives of fellows and members exercise the same privilege in the absence of their husbands.

Honorary, foreign, and corresponding members have personal admission to the gardens and museum on all occasions when they are open to the fellows and annual subscribers. Fellows, annual subscribers, honorary, foreign, and corresponding members, are entitled to one copy of the scientific proceedings of the society on application at the office, and are entitled to purchase the Transactions and other publications of the society at 25 per cent. less than the price charged to the public. They may obtain, on the payment of one guinea annually, an ivory ticket, which will admit a named person of their immediate family to the gardens and museum with one companion daily. The public are admitted to the gardens on payment of one shilling for each person. This charge is reduced to sixpence on Mondays.

The gardens are open from nine o'clock A.M. till sunset. The museum, from ten till six; and the office, from ten till five.

ROYAL GEOGRAPHICAL SOCIETY, 3, WATERLOO PLACE.

The Royal Geographical Society of London was established in 1830, for the improvement and diffusion of geographical knowledge. Its offices are at 3, Waterloo Place, where there is a small but good geographical library, and a collection of maps, charts, and instruments connected with geographical science, to which all the members have access.

The mode of admission to this society is by the recommendation of two or more members, after which the decision is made by ballot. Every ordinary member is required to pay 3*l.* as his admission fee, and 2*l.* annual subscription, or he may compound for both by one payment of 28*l.*

The meetings are of three kinds, anniversary, special, and ordinary. The anniversary meeting is held on the fourth Monday in May, when two gold medals, the gift of the Queen, are presented to the two most distinguished promoters of geographical discovery. The ordinary meetings are held on the second and fourth Monday of every month, or oftener, if judged expedient by the council. Visitors, if introduced by members, are allowed to be present. The members or fellows are known respectively by the initial letters, M.R.G.S., or F.R.G.S.

GAELIC SOCIETY, BRITISH COFFEE HOUSE, COCKSPUR STREET.

The Gaelic Society was instituted in 1830, the principal objects being to accustom the members to the language, poetry, music, and dress of the Gael. The fundamental rules are that no man shall be deemed eligible as an associate who cannot speak the Gaelic language, in which the affairs of the society are to be conducted; that in the event of a dissolution of the society, its property be given to "The Society for Supporting Gaelic Schools in the Highlands and Islands of Scotland." The meetings are held on the second Monday of each month, at the British Coffee House, Cockspur Street. The anniversary is on the 17th of August.

In the catalogue of books, &c., published by the society, Mr. James Logan, the secretary, has introduced a sketch of the origin and progress of Scottish Societies in London, and elsewhere, instituted for the purposes of philanthropy and the preservation of national usages. Referring to the present society, he says—"It has frequently been observed that the Highlanders are behind in the advance of intellectual knowledge, especially as relates to their own particular literature. There are certainly no very encouraging circumstances to induce them to devote time and means to objects, the pursuit of which is reckoned by the unthinking in this utilitarian and cosmopolitic age, unprofitable and indicative of narrow ideas; but as *amor patriæ* is a feeling implanted in the very nature of man, which impels him to take more interest in his own relations—in his own friends—in his own countrymen, and all that pertains to his common race and fatherland, than to those which are foreign to him; it has led to the most brilliant deeds in arms and discoveries in art throughout the world, and the study of national literature will assuredly enlarge the mind, and render individuals more useful in their sphere, and better members of general society."

UNITED SERVICE INSTITUTION, SCOTLAND YARD.

The United Service Institution was founded in 1830 by members of the naval and military profession, as a repository for various objects of scientific and general interest, as a means of communication among the numerous officers who are able and willing to contribute to the promotion of science and art, and as a place where lectures might be held, and documents received on subjects of common interest to naval and military men. No sooner was the plan of this institution arranged, than collections and specimens in natural history were freely contributed for the foundation of the museum, which is now sufficiently extensive to occupy four or five rooms, and to constitute one of the sights worth seeing in the metropolis. The model room contains models, in great variety, of ships, gun-carriages, &c., and specimens of different forms of life-buoy, models of military waggons, gun-boats, canoes, &c. The armoury contains weapons of various countries, African swords and daggers, Chinese and Indian weapons, clubs, spears, fighting-dresses, with a large assortment of English swords, spears, cross-bows of olden times, and distinct stands of arms used in the military and naval service in particular reigns. Two other rooms are devoted chiefly to collections in natural history, stuffed animals, and birds, cases of minerals, reptiles preserved in spirits, insects, &c. Very little arrangement has hitherto been attempted in this museum, which lessens the interest in examining it; but there are numerous objects of popular interest in these rooms as well as in the armoury. Here, for instance, is the skeleton of Marengo, the barb charger which Napoleon Bonaparte rode at the battle of Waterloo; while in the armoury there is the crimson sash by which Sir John Moore was lowered to his grave, a piece of the gold lace from Nelson's coat worn at Teneriffe, the swords of Oliver Cromwell and General Wolfe, &c.

The fifth room of the museum contains objects of the most miscellaneous description, a principal part being dresses and ornaments of rude nations. The contents of this, and indeed of all the other rooms, stand greatly in need of the classification and arrangement which we believe they are ere long destined to receive. The mode of admission to this museum is by a member's order, which is very easily procurable. The members are above 4000 in number. Each pays an entrance fee of 1*l.*, and an annual subscription of 10*s.* The hours of admission are from eleven till five daily, from April to September, and from eleven till four during the winter months.

ENTOMOLOGICAL SOCIETY, 17, OLD BOND STREET.

The Entomological Society of London was organized in 1833, for the improvement and diffusion of entomological science, and the first general meeting of the society was held in May, 1834, with the Rev. W. Kirby, the father of British entomology, as its president. Many of the most able and active cultivators of entomology were desirous of establishing a more familiar intercourse between their fellow labourers than had hitherto subsisted in this country, hoping thus to accelerate the progress of the science, and to promote its utility. They therefore held periodical meetings, at which memoirs were received and read, experiments for the destruction of noxious insects suggested, communications made, and objects exhibited. They also began to form a collection of insects, and a library of reference. Since that time the society has annually published many valuable papers, of great practical importance to the agriculturist, especially those illustrating the history and habits of injurious insects, and the means of arresting their ravages. The valuable collections of Mr. Kirby were generously presented to this society at its commencement, and the gift is thus alluded to in their first report. "Few but entomologists can appreciate the value of this remarkable gift. We are now possessed of the very specimens from which the first of monographs ever published was formed. We have under our eyes the materials from which Messrs. Kirby and Spence derived their well-known 'Introduction to Entomology,' a work which has well stood the test of time; and although science has greatly progressed since its publication, it requires little to be blotted from its pages. When it appeared, it put to flight many of the errors of centuries: it checked the superstition of the nursery, assisted to remove the ignorance of the drawing-room, and the misconceptions of our rural population; and although some prejudices still prevail respecting insects, such as 'blight in the air,' and the ominous 'death-watch,' yet we can now only regard them as the lingering mists of ignorance, about to disappear before the daily increasing light of knowledge."

This society is managed by the usual list of officers. The annual contribution is 1*l.* 1*s.*, or a composition of 10*l.* 10*s.* The admission fee is 2*l.* 2*s.*

The important ends to be answered by the study of insect life are well alluded to in the following extract from the president's address at the anniversary meeting of 1844:—

"The great object of all scientific research is the welfare and improvement of mankind. All inquiries that tend to this object, however remotely connected with it, deserve the attention of the philosopher and the philanthropist. Observations on the habits and economy of insects, independently of their immediate connection with the cultivation of the soil, are of high importance with reference to our arts and manufactures; and are valuable, not merely to individual enterprise, but to the commerce of the whole world. The dye, the wax, the silk, contribute to the riches and comfort of thousands, and even supply means of existence to tens of thousands; yet the value and most successful cultivation of these can only be improved by attention to the habits of the diminutive creatures by which they are produced. In like manner, attention to the habits, and experiments on the functions, of these 'miniatures of creation,' become of immense importance when the knowledge of the entomologist is combined on the one hand with the skill of the analytic chemist, in watching the processes, or in testing the products, of their little vital laboratories; or, on the other hand, is employed in assisting to guide the diminutive scalpel, or the eye of the comparative anatomist and physiologist, in his microscopic investigations of structure or function. Entomological knowledge unapplied and alone, like that of many other pursuits, may perhaps be of little absolute value; but when combined with that of the chemist, the physiologist, or the anatomist, it leads to a result of the highest possible importance to mankind—the right understanding of the great laws of life in health and disease, which alone enables the physician to apply his experience with success in restoring to us that which is more valuable than all the comfort that riches or luxury can contribute."

STATISTICAL SOCIETY, 12, ST. JAMES'S SQUARE.

The Statistical Society of London was founded in 1834, for the purpose of improving statistical knowledge. It had been projected at Cambridge, during the meeting of the British Association for the Advancement of Science. In the introduction to the journal of this society, dated May, 1838, it is stated that only within a few years has the science of statistics been actively pursued in this country. "The word statistics is of German origin, and is derived from the word *staat*, signifying the same as our English word *state*, or a body of men existing in a social union. Statistics, therefore, may be said to be the ascertaining and bringing together of those facts which are calculated to illustrate the condition and prospects of society; and the object of statistical science is to consider the results which they produce, with the view to determine those principles upon which the well-being of society depends. Statistics differs from political economy, because, although it has the same end in view, it does not discuss causes, nor reason upon probable effects; it seeks only to collect, arrange, and compare that class of facts which alone can form the basis of correct conclusions with respect to social and political government."

In 1832, Lord Auckland and Mr. Poulett Thomson, who then presided over the Board of Trade, established a statistical office in that department, for the purpose of collecting, arranging, and publishing statements relating to the condition, and bearing upon the various interests of the British Empire. Volumes prepared by this office are annually printed and laid before Parliament. In 1833 the statistical section was formed in the British Association for the Advancement of Science, and before the close of that year the Manchester Statistical Society was established. Societies for prosecuting statistical inquiries have sprung up throughout the kingdom.

The society divides the scope and system of its labours into the following important heads:—

1. The statistics of physical geography, division, and appropriation; or geographical and proprietary statistics.
2. The statistics of production; or agricultural, mining, fishery, manufacturing, and commercial statistics.
3. The statistics of instruction; or ecclesiastical, scientific, literary, university, and school statistics.
4. The statistics of protection; or constitutional, military and naval, judicial, criminal, and police statistics.
5. The statistics of life, of consumption, and of enjoyment; or of population, health, the distribution and consumption of the commodities of life, and public and private charity.

The number of fellows of this society is unlimited. Admission is obtained by a recommendation from two fellows, and by ballot; and a yearly subscription of 2*l.* 2*s.* is paid in advance, or is compounded for by one payment of 20 guineas. Foreign members to the number of fifty, and corresponding members to an unlimited extent, are admitted free of payment. The business of the society is transacted by a council of thirty-one members, including the president, vice-president, &c. The ordinary meetings of the society are held monthly during the session, which lasts from 1st of November to 1st of July. The anniversary meeting takes place on the 15th of March, or on the following day if the 15th fall on a Sunday. The result of this society's labours may be gathered from a published journal of its proceedings, of which there are several volumes. The office of the society is at 12, St. James's Square. There is no difference made in this society as to resident and non-resident fellows. Members adopt the initials F.S.S.

BOTANICAL SOCIETY OF LONDON, 20, BEDFORD STREET, COVENT GARDEN.

The Botanical Society of London was instituted November 29, 1836, for the promotion and diffusion of botanical knowledge, for the formation of British and general herbaria, for the exchange of specimens with other societies, for the establishment of a library for reference and circulation, and for holding evening meetings, receiving communications, and publishing important facts and views. Its offices are at 20, Bedford Street, Covent Garden, where an extensive herbarium is open for inspection of members and other botanists, every Friday evening from seven to ten o'clock. The library is open on the same day. The meetings of the society are held on the first Friday of every month, at eight o'clock P.M., except in December. The anniversary meeting is held on the 29th November, being the birthday of Ray, the botanist. The annual subscription for resident members is 1*l.* 1*s.*, and the entrance fee is the same. Non-resident members pay 10*s.* 6*d.* The members are known respectively by the initial letters M.B.S.L.

The great advantage connected with membership in this society is the extent of knowledge gained through the exchange of British and foreign specimens, and the facilities afforded for forming complete and valuable herbaria. The herbarian committee justly state that neither private correspondence nor membership of any other association has ever given British botanists those advantages in forming their herbaria, which are realized by the members of the Botanical Society of London.

NUMISMATIC SOCIETY, 41, TAVISTOCK STREET, COVENT GARDEN.

This society was instituted on the 22nd December, 1836, chiefly through the exertions of John Lee, Esq., LL.D., and a few other gentlemen; and its first ordinary meeting was held 26th January, 1837. Its object is the encouragement and promotion of numismatic science in all its branches. The admission fee is 1*l.* 1*s.*, and the annual subscription 1*l.* 10*s.* This entitles the members to the numbers of the "Numismatic Chronicle," published quarterly, and edited by J. Y. Akerman, Esq. The ordinary meetings occur on the last Thursday in each month from November till May, inclusive, at 7 o'clock. The members are known respectively by the initial letters M.N.S.

ORNITHOLOGICAL SOCIETY.

This society was established in 1837, for the purpose of breeding and forming collections of water-fowl; first, to supply the royal parks; and, secondly, to distribute duplicates, gratuitously, among such members as may be desirous of acquiring a collection of aquatic birds. The society endeavours to maintain a complete collection of water-fowl—swimmers, divers, and waders. The birds are kept as nearly as possible in a natural state, in St. James's Park, where the lake forms as it were a great natural cage. The birds are very tame, and being placed under the protection of the public, are great favourites, a large portion of their food being supplied by visitors. The president of this society is the Duke of Buccleuch and Queensberry.

ROYAL AGRICULTURAL SOCIETY, 12, HANOVER SQUARE.

The Royal Agricultural Society of England was established in 1838, with the view of improving the general system of agriculture in this country, and of engaging talented men in the investigation of such subjects as are of deep practical importance to the British farmer. The labours of this society have been of immense advantage to the agricultural interest, and its published journal is one of the most useful and interesting periodicals which a farmer can study. This society holds an annual meeting in London, and also an annual country meeting, the latter including a cattle-show, an exhibition of agricultural implements and inventions, and the awarding of prizes in either department. The first country meeting was held in Oxford, in the summer of 1839, when an immense multitude of persons assembled, among whom were two or three thousand eminent cultivators of the soil, breeders of stock, &c. The meeting was held next at Cambridge, and then at other important towns, in succession. In 1840 the society was incorporated by royal charter, and its objects were distinctly assigned to be: first, to embody such information contained in agricultural publications and in other scientific works as has been proved by practical experience to be useful to cultivators of the soil; second, to correspond with agricultural, horticultural, and other scientific societies, both at home and abroad, and to select from such correspondence all information which, according to the opinion of the society, may be likely to lead to practical benefit in the cultivation of the soil; third, to pay to any occupier of land, or other person who shall undertake at the request of the society to ascertain by experiment how far such information leads to useful results in practice, a remuneration for any loss that he may incur by so doing; fourth, to encourage men of science in their attention to the improvement of agricultural implements, the construction of farm-buildings and cottages, the application of chemistry to the general purposes of agriculture, the destruction of insects injurious to vegetable life, and the eradication of weeds; fifth, to promote the discovery of new varieties of grain and other vegetables useful to man, or for the food of domestic animals; sixth, to collect information with regard to the management of woods, plantations, and fences, and on every other subject connected with rural improvement; Seventh, to take measures for the improvement of the education of those who depend upon the cultivation of the soil for their support; eighth, to take measures for improving the veterinary art, as applied to cattle, sheep, and pigs; ninth, at the meetings of the society in the country, by the distribution of prizes, and by other means, to encourage the best mode of farm cultivation, and the breed of live stock; tenth, to promote the welfare and comfort of labourers, and to encourage the improved management of their cottages and gardens.

The society consists of a president, trustees, vice-presidents, governors, and members. The governors pay 5*l.* annually, the members 1*l.*, or they can compound for life by paying ten annual subscriptions. Numerous and liberal prizes are awarded by this society, not only for cattle and implements of a superior kind, but for essays on modes of farming, &c. A notice of the prizes held out in 1846, which we take at random from the journal of the society, will show the nature and amount of these rewards. Fifty sovereigns, or a piece of plate of that value, for the best report on the farming of North Wales. The same for the West Riding of Yorkshire, and for the farming of Cambridgeshire. Fifty sovereigns, or plate, for the best report on the advantages and disadvantages of breaking up grass land. Thirty sovereigns for the best essay on the improvement of the condition of the agricultural labourer. Ten sovereigns for the best essay on the keeping of farm accounts. Twenty sovereigns for the best account of task-work. Twenty sovereigns for an essay on peat charcoal as a manure for turnips, &c. Ten sovereigns for the best account of the use of acid with bones. Ten sovereigns for an account of the cultivation of white mustard; and ten sovereigns for the best account of the draining of running sands.

The rooms of the Royal Agricultural Society are at 12, Hanover Square, London. The president is the Right Hon. Lord Portman.

MICROSCOPICAL SOCIETY, 21, REGENT STREET.

The Microscopical Society was established in 1839, for the improvement of microscopic science, and of the instruments by which its investigations are carried on, and for the formation of a library of standard microscopical works. The meetings of this society are held at the rooms of the Horticultural Society, 21, Regent Street. The members pay 1*l.* 1*s.* annual subscription, and 1*l.* 1*s.* entrance; the former may be compounded for in the usual way. A candidate must be recommended by three members, and balloted for. A majority of two-thirds is necessary to secure his admission. The society publishes its Transactions.

Weekly meetings take place at seven o'clock on Wednesday, from October till June. The chair is vacated at nine, and the meeting assumes the form of a conversazione.

The Microscopical Society owes its existence to the exertions of a few gentlemen engaged in scientific pursuits, who aimed at affording assistance and encouragement to microscopical investigations, "by promoting that ready intercourse between those engaged in such pursuits, by which not only are great advantages mutually gained, but also information of the most valuable kind disseminated and perpetuated. Another important consequence resulting from the establishment of this society, and the increasing interest in microscopical pursuits excited by it, is the encouragement and stimulus given to the scientific makers of the microscope, by which that valuable instrument is now rapidly advancing to the highest degree of perfection."*

CHEMICAL SOCIETY, (*pro tem.*) JOHN STREET, ADELPHI.

The Chemical Society of London was established in 1841, for the promotion of chemistry, by communications and discussions, and by collecting a library, museum, and standard instruments. But there are vestiges of a much older society, established for the same ends. This was set on foot in 1780, at which time chemistry began to be very much cultivated. Professor Playfair described a Chemical Society, in 1781, as meeting at the Chapter Coffee House. "Here I met," he says, "a venerable old man, Mr. Whitehurst, author of 'An Inquiry into the Formation of the Earth,' Dr. Keir, Dr. Crauford, and several others. The conversation was purely chemical, and turned on Bergmann's experiments on iron." This society appears to be alluded to by Franklin, in a letter to Mr. Passy, in 1781, in which he says, "Present my affectionate respects to that honest, sensible, and intelligent society, who did me the honour of admitting me to share in their instructive conversations. I never think of the hours I so happily spent in that company without regretting that they are never to be repeated, for I see no prospect of an end of this unhappy war in my time. Dr. Priestley, you tell me, continues his experiments with great success."

The present society consists of ordinary and foreign members, and of associates. A candidate must be recommended by three members, and his certificate suspended in the room during three ordinary meetings. He is elected by having three-fourths of the votes in his favour. The subscription is 2*l.* annually for resident members, (namely, all within 20 miles of London,) and 1*l.* by non-resident members. The meetings are held, at present, in the rooms of the Society of Arts, John Street, Adelphi, on the first and third Mondays of every month, from November to June, at eight o'clock. The anniversary is held on the 30th of March, at the same hour. Subscriptions are reckoned from the Lady Day or Michaelmas preceding the election of the candidate. The president of this society is W. T. Brande, Esq., whose valuable works on chemistry are in the hands of most students of that science.

PHILOLOGICAL SOCIETY, LONDON LIBRARY, ST. JAMES'S SQUARE.

This society was formed on the 18th May, 1842, for the purpose of investigating the structure, affinities, and history of languages, and for the philological illustration of the classical writers of Greece and Rome. The members are elected by ballot, and the payments are 1*l.* 1*s.* on admission, and 1*l.* 1*s.* annually, due on the 1st January. The life composition is 10*l.* 10*s.* The meetings are held on the second and fourth Fridays in every month, from November to June, inclusive, except during the Christmas and Easter holidays, at eight o'clock. The anniversary is on the fourth Friday in May. The members use the initial letters M.P.S., or F.P.S. A journal of proceedings is published. The president is the Right Rev. the Lord Bishop of St. David's. The secretary is E. Guest, Esq., and the assistant-secretary, Mr. J. G. Cochrane.

ETHNOLOGICAL SOCIETY, 27, SACKVILLE STREET.

The Ethnological Society of London was founded by Dr. King, in 1843, for the purpose of inquiring into the distinguishing characteristics, physical and moral, of the varieties of mankind which inhabit or have inhabited the earth, and to ascertain the causes of such characteristics. Fellows are admitted by ballot. The annual subscription is 2*l.*, and the life composition 12*l.* A journal is published by the society. The meetings are held monthly, from November to June, inclusive, and the anniversary is held in May. The president is Dr. J. C. Prichard, and the secretary, Dr. King.

ARCHÆOLOGICAL ASSOCIATION, 32, SACKVILLE STREET.

Office at Mr. Bohn's, York Street, Covent Garden.

The British Archæological Association was established in 1843, for the encouragement and prosecution of researches into the arts and monuments of the middle ages, particularly in England.

The association comprises *associates* and *correspondents*, the first consisting of annual subscribers of 1*l.* 1*s.* and upwards, or of life subscribers of 10*l.* 10*s.* These are entitled to receive the Quarterly Journal of the society, and to attend the meetings held in London twice a month. A general meeting or congress is held once in the year in one of the towns of England, lasting for a week, and a volume is published recording the proceedings during this period. Public meetings are held in London at half-past eight P.M., on days previously notified to the subscribers.

Associates are elected by the council. Correspondents are elected on the recommendation of the president, of two members of council, or of four associates. Distinguished foreigners are admitted as honorary members.

The president for 1851 is J. Heywood, Esq., M.P. The secretaries are R. J. Planché and C. Bailey, Esqs. There is also a secretary for foreign correspondence, and a hydrographical secretary.

ARCHÆOLOGICAL INSTITUTE, 12, HAYMARKET.

The Archæological Institute of Great Britain and Ireland was established in December, 1843, under the title of the *British Archæological Association.* Its objects are to investigate, preserve, and illustrate all ancient monuments of history, customs, arts, &c., relating to the United Kingdom.

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* Preface to Vol. I. of the Society's Transactions, 1844.

The annual payment is 1*l.* or upwards. The life composition is 10*l.* The society includes *subscribing* members, *honorary* members, and *corresponding* members.

The books, drawings, and general collection of this society are kept at No. 12, Haymarket, where business is transacted; but the monthly meetings of the members, for the purposes of discussion, are held in the theatre of the Institution of Civil Engineers, 25, Great George Street, Westminster. These meetings are held on the first Friday in each month, from November to June, inclusive, at 4 o'clock. The annual meeting is held in one of the cathedral towns or great cities of the kingdom, and lasts a week. A volume of proceedings is published every year.

The president elected for 1851 was the late much-lamented Marquess of Northampton. The honorary secretaries are Charles Tucker, Esq., and Albert Way, Esq. The secretary is George Vulliamy, Esq.

SYRO-EGYPTIAN SOCIETY, 71, MORTIMER STREET, CAVENDISH SQUARE.

This society was established in December, 1844, to encourage and advance literature, science, and the arts in Egypt, Nubia, Abyssinia, Arabia, Palestine, Syria, Mesopotamia, and Asia Minor; to collect interesting, instructive, and authentic information respecting those lands; to cultivate the study of hieroglyphics and oriental languages; to preserve copies of ancient inscriptions; to watch over, explore, and protect the relics of antiquity; and to direct the attention of travellers to those subjects that are most worthy of investigation.

The annual subscription is 1*l.* 1*s.* for resident members; non-resident members pay nothing. The annual meeting is on the 23rd April. The ordinary meetings are on the first Tuesday in each month, from November to June, at 8 o'clock.

ROYAL COLLEGE OF CHEMISTRY, 16, HANOVER SQUARE.

This college was founded in July, 1845, for the purpose of affording opportunities for instruction in practical chemistry, at a moderate cost, and for promoting the general advancement of chemical science, and its applications to agriculture, manufactures, and the useful arts. The annual subscription is 2*l.* 2*s.* The anniversary is on the first Monday in June. H.R.H. Prince Albert is president.

PATHOLOGICAL SOCIETY, 21, REGENT STREET.

This society was instituted for the exhibition and examination of specimens, drawings, microscopic preparations, casts or models of morbid parts, with accompanying written or oral descriptions, illustrative of pathological science.

Resident members, or those residing within ten miles of the General Post Office, pay 1*l.* 1*s.* on admission, and 1*l.* 1*s.* annually. Non-resident members pay a life subscription of 2*l.* 2*s.* The meetings are held twice in the month, on Tuesday evenings, from October to June, inclusive.

PUBLISHING SOCIETIES.

THE ORIENTAL TRANSLATION FUND.

In the year 1828 some members of the Royal Asiatic Society instituted a fund for the publication of translations from Eastern MSS. into the languages of Europe. A committee was appointed to superintend the publications, which already amount to sixty-two distinct works, in about seventy-two volumes. The annual subscription is 10*l.* 10*s.* for large paper copies; and 5*l.* 5*s.* for small paper copies.

THE CAMDEN SOCIETY, 25, PARLIAMENT STREET.

This society was established in 1838, for the publication of historical documents, letters, ancient poems, and other materials which are but little known, for the purpose of illustrating the civil, ecclesiastical, or literary history of the United Kingdom. The society takes its name from Camden, the author of "Britannia," and the historian of Queen Elizabeth. Members pay 1*l.* per annum, or a composition of 10*l.* The publication of the works of the society is superintended by a council of fifteen; but each editor corrects the proofs of the work which he has undertaken to superintend. Provincial local secretaries transmit the books to country members. The Right Hon. Lord Braybrooke is the president.

THE PARKER SOCIETY, 33, SOUTHAMPTON STREET, STRAND.

This society takes its name from Martin Parker, Archbishop of Canterbury, "a great collector of ancient and modern writings, who took especial care of the safe preservation of them for all succeeding times; as foreseeing, undoubtedly, what use might be made of them by posterity: that by having recourse to such originals and precedents, the true knowledge of things might the better appear."

The society was instituted in 1840, for the purpose—first, of reprinting without abridgment, alteration, or omission, the best works of the fathers and early writers of the Reformed English Church, published in the period between the accession of Edward VI. and Elizabeth; secondy, for the purpose of printing such other writers of the sixteenth century as may appear desirable (including under both periods some of the early English translations of the foreign reformers); and, thirdly, for printing some MSS. of the same authors, hitherto unpublished.

The annual subscription is 1*l.* The council consists of a president, treasurer, honorary librarian, and twenty-four members of the Established Church, of whom sixteen at least must be clergymen. The president is the Right Hon. Lord Ashley, M.P.

THE PERCY SOCIETY, 100, ST. MARTIN'S LANE.

The object of this society (founded in 1840, and named after Dr. Percy, editor of "Reliques of Ancient English Poetry") is to bring to light important but obscure specimens of Ballad Poetry, or works illustrative of that department of literature. The number of members is limited to 500, and the annual subscription is 1*l.* The publications of the society are numerous. Lord Braybrooke is the president.

THE SHAKSPEARE SOCIETY, 9, GREAT NEWPORT STREET, LEICESTER SQUARE.

The Shakspeare Society was founded in 1840, for the purpose of printing and distributing to its subscribers books illustrative of our great dramatic poet, and the literature of his time. Any respectable person is admitted to the society on application to the secretary, and on payment of an annual subscription of 1*l.* The Earl of Ellesmere is the president. The council, which is composed of the president, six vice-presidents, and twenty-one members, meet on the second Tuesday in every month, at the rooms of the Royal Society of Literature, 4, St. Martin's Place, Trafalgar Square, to select and superintend the works printed by the society. The annual meeting is on the 26th April. The editors and the council render their services to the society gratuitously; and means are adopted to expend as nearly as possible the whole amount of the subscriptions in producing books.

SOCIETY FOR THE PUBLICATION OF ORIENTAL TEXTS.

Royal Asiatic Society.

This society was founded in 1841, for the purpose of enabling learned orientalists to print standard works in the Syriac, Arabic, Persian, Turkish, Sanscrit, Chinese, and other languages of the East, by defraying either wholly or in part the cost of such printing and publication. The annual subscription is 2*l.* 2*s.*, which entitles each member to a large paper copy of every work published by the aid of the fund. The president is Dr. Horace Hayman Wilson, Boden Professor of Sanscrit in the University of Oxford.

THE ÆLFRIC SOCIETY, 177, PICCADILLY.

This society, founded in 1842, takes its name from Aelfric, or Alfric, Archbishop of Canterbury (ob. 1006), whose collection of Homilies has preserved his name to our own times. The object of the society is the publication of Anglo-Saxon and other literary monuments, civil and ecclesiastical, which tend to illustrate the early state of England, preference being given to such works as have not yet been printed. The Anglo-Saxon originals are accompanied with a translation. The number of members is limited to 500, each paying 1*l.* on admission, and 1*l.* annually, or a composition of 12*l.* There are seventeen members of council, including a director, a treasurer, and secretary. There are also six local secretaries. The Earl of Ellesmere is president.

THE SYDENHAM SOCIETY, 45, FRITH STREET, SOHO.

This society, instituted in 1843, takes its name from the celebrated physician, Dr. Sydenham, and its object is to publish works connected with medical literature, consisting of—1. Reprints of standard English works which are rare and expensive. 2. Miscellaneous selections from the ancient and earlier modern authors, reprinted or translated. 3. Digests of the works of old and voluminous authors, British and foreign, with occasional biographical and bibliographical notices. 4. Translations of the Greek and Latin medical authors, and of works in the Arabic and other Eastern tongues, accompanied, if desirable, by the original text. 5. Translations of recent foreign works of merit. 6. Original works of merit which might prove useful as books of reference, such as bibliographies, alphabetical and digested indexes to voluminous periodical publications, &c.

The number of members is unlimited, and the number of copies of any work published by this society corresponds to that of the existing members. The annual subscription is 1*l.* 1*s.* Dr. Paris is the president, Dr. Bennett, secretary, and there are upwards of 100 local secretaries.

THE RAY SOCIETY, 22, OLD BURLINGTON STREET.

This society, founded in 1844, takes its title from John Ray, the celebrated naturalist (ob. 1704), and its object is the promotion of natural history, by the printing of original works in zoology and botany, of new editions of works of established merit, of rare tracts and MSS., and of translations and reprints of foreign works. The society does not print anything which appears suitable to the Transactions of established societies, nor any work which a respectable publisher would undertake to publish without charge to the author. The number of members is unlimited, and the number of copies of each work is regulated by that of the members. The annual subscription is 1*l.* 1*s.*

The council consists of 21 members, of whom at least a third reside in London. The local secretaries are numerous. The anniversary is held at the time and place of the meeting of the British Association for the Advancement of Science. The president is Professor Bell, F.R.S., F.L.S.

THE WERNERIAN CLUB, 219, REGENT STREET.

This club, established in 1844, and named after Werner, has for its object the republication of —1. Modern editions of standard scientific authors of old date, with additions and notes in conformity with the views of modern science. 2. Works by modern authors, presented to and approved by the club. 3. Miscellaneous essays. The ordinary members are limited to 25, the associates (not resident within 30 miles of London) to 50, and the honorary members to six. Members pay 1*l.* 1*s.* each annually, and associates 10*s.* 6*d.* Every member receives three copies of each publication, and every associate one copy. Subscribing members may also receive the publications of the society on payment of the annual sum of 10*s.* 6*d.* The president is Dr. Aldis.

THE CAVENDISH SOCIETY, 19, MONTAGUE STREET, RUSSELL SQUARE.

This society, which is named after the Hon. Henry Cavendish, was established in 1846, for the promotion of chemistry and its allied sciences, by the diffusion of the literature of these subjects. The society effects its objects by the translation of recent works and papers of merit; by the publication of valuable original works which would not otherwise be printed, from the slender chance of their meeting with a remunerative sale; and by the occasional republication or translation of such ancient or earlier modern works as may be considered interesting or useful to the members of the society.

Members, who are admitted on application to the general or local secretaries, pay an annual subscription of 1*l.* 1*s.*, and are entitled to a copy of every work published by the society for the period during which their membership continues. The number of works thus published will necessarily depend on the number of annual subscribers; but it is anticipated that, when the advantages afforded by the society become generally known, the number of subscribers will be adequate to the expense of publishing three octavo volumes each year. Professor Graham is the president.

The society is about to publish a life of Cavendish, with a portrait of that illustrious philosopher, from a sketch which has just been discovered in the print room of the British Museum. The engraving at page 549 is taken from that sketch, and is peculiarly interesting from the circumstance that Cavendish never sat for his portrait, and that this is the only one known.

THE HAKLUYT SOCIETY, 100, ST. MARTIN'S LANE.

This society, formed in 1846, and named after Richard Hakluyt (ob. 1616), a zealous collector of British voyages and travels, has for its object the printing of rare or unpublished voyages and travels, and by this means aims at opening an easier access to the sources of a branch of knowledge, which yields to none in importance, and is superior to most in agreeable variety. " The narratives of travellers and navigators make us acquainted with the earth, its inhabitants and productions; they exhibit the growth of intercourse among mankind, with its effects on civilization, and, while instructing, they at the same time awaken attention, by recounting the toils and adventures of those who first explored unknown and distant regions."

The annual subscription is 1*l.* 1*s.* The president is Sir R. J. Murchison.

MECHANICS' INSTITUTIONS, AND LITERARY AND SCIENTIFIC INSTITUTIONS.

It is not improbable that some of the members of the learned societies, to which this portion of our book is chiefly devoted, would object to any notice of mechanics' and similar institutions as an appendix to their own more efficient and commanding corporations; but as the writer of this notice is too deeply interested in the cause of popular education to estimate lightly the advantages of institutions which enable men who have passed their days in labour, to assemble in the evening for the purposes of being instructed, and of instructing each other, it is proposed to give a brief account of Mechanics' and Literary and Scientific Institutions, which, if they do not rank among *learned* societies, may at least find a place among *useful* ones; for it cannot be denied that an intelligent population is safer than an ignorant one; and it is the object of these societies to diffuse intelligence among the masses whose means do not permit them to seek light from a more elevated source.

The instruction of the people by means of Mechanics' Institutions is due to a good and accomplished man, the late Dr. Birkbeck, who, from his position as professor in the Anderson College of the large manufacturing town of Glasgow, had frequent opportunities of witnessing the intelligence and aptitude for being taught of mechanics and working men. So long since as the year 1800, he announced a course of lectures on natural philosophy, and its application to the arts, for the instruction of mechanics. At first only a few availed themselves of the rare privilege of attending these lectures; but the extraordinary perspicuity of the teacher's method, the judicious selection of experiments, and the natural attractions of the subject, soon appealed successfully to men whose lives were passed in directing or witnessing operations, the principles of which were now for the first time unfolded to them. Shortly before Dr. Birkbeck left Glasgow (two or three years afterwards), his lectures were attended by upwards of 700 earnest and constant listeners.

The institution thus auspiciously begun, continued to flourish under the able guidance of Dr. Birkbeck's successors. It is remarkable, however, that nearly twenty years elapsed before a similar institution was founded; but we may find a solution to the difficulty in the distresses of the times, in political agitations, and a determined opposition among the upper classes to the scientific education of working men *. In 1821 a similar institution was established in Edinburgh, and met with complete success.

As the knowledge of the steps by which the Edinburgh Institution was so successfully founded may be of use elsewhere, it may be desirable to give a short statement of them.

The promoters of the plan began by drawing up a short sketch of the proposed institution, and causing it to be circulated among the principal master mechanics, with a request that they would read it in their workshops, and take down the names of such of the men as were desirous of being taught the principles of those sciences most useful to artisans. In the course of ten days, between 70 and 80 names were entered; and a private meeting was held of a few gentlemen who were disposed to encourage the experiment. They resolved to commence a subscription for the purpose. In April, 1821, they issued a prospectus among the artisans, announcing the commencement of a course of lectures on mechanics, and another on chemistry, in October following, as also the opening of a library of books on the same subjects, for perusal at home as well as in the reading-room; the hour of lecture to be from 8 to 9, P.M., twice a week for six months, and the terms of admission to the whole, 15*s.* a year. A statement was also circulated, announcing the establishment of a "School of Arts," with the particulars of the plan; and so well was it received by all classes, that in September notice was given of 220 mechanics having entered as students, and such a sum having been subscribed as enabled the directors to open the establishment on the 16th October.

The precise objects of this plan were thus stated:—

"The great object of this institution is to supply, at such an expense as a working tradesman can afford, instruction in the various branches of science which are of practical application to mechanics in their several trades, so that they may the better comprehend the reason for each individual operation that passes through their hands, and have more certain rules to follow than the mere imitation of what they may have seen done by another. It is not intended to teach the trade of the carpenter, the mason, the dyer, or any other particular business; but there is no trade which does not depend more or less upon scientific principles, and to teach what these are, and to point out their practical application, will form the business of this establishment. He who unites a thorough knowledge of the principles of his art with that dexterity which practice, and practice only, can give, will be the most complete, and probably the most successful, tradesman.

"As there is a great deal to be taught, and it is not the purpose of the school of arts to give a mere smattering of knowledge as the amusement of a vacant hour, but to afford solid instruction to those who will take it, it is not possible during the first year to do more in the space of time which tradesmen can reasonably spare, than to teach the more general principles of chemistry and mechanical philosophy, together with a brief notice of their practical application in some of the principal arts. A more minute and detailed instruction, upon particular branches of art, will form the subject of subsequent courses of lectures, after the students have had an opportunity of acquiring an elementary education from the first course of lectures, and from the books they will be supplied with from the library, and of thus becoming better prepared for understanding them."

When the lectures commenced 272 students had purchased tickets, and the institution was opened in the presence of the magistrates of the city, and some of the most distinguished of its patrons, by an excellent address from the secretary, Mr. L. Horner, on the part of the directors. During the six months in which the lectures were given, 452 persons had entered. The library was increased by liberal donations, and it was placed under the management of twelve students, chosen by the directors, and attending four by rotation each night, for the purpose of taking in and giving out books, that is, twice a fortnight. The average number of books taken out each night was 210, and the eagerness to have them may be seen from this, that a fine of 6*d.* a fortnight being imposed, though not a volume was lost, nearly 200 fines were paid.

The mechanical lectures had hardly begun, when some of the students, finding the want of mathematical knowledge, proposed to the directors to form themselves into a class, under one of their own number, a joiner, who had agreed to teach them gratuitously the elements of geometry, and the higher branches of arithmetic. The plan was adopted with distinguished success. The number was limited to thirty, and was arranged in five divisions, each under the best scholar, as a monitor, going over on one night the lessons of the night before. Those who were excluded from this class formed another on the same plan, under a cabinet maker, also a student of the School of Arts. A class was also opened for architectural and mechanical drawing, consisting of two courses, of two months each, for twenty students; the sum paid being 5*s.*, and each pupil finding his own drawing materials. Of this they eagerly availed themselves, and each class received twenty-five lessons, of two hours.

The Institution was managed by fifteen directors and a president, chosen annually by the subscribers, and provision was made that master mechanics should have a share in the direction.

We next proceed to notice the formation of the London Mechanics' Institution.

Dr. Birkbeck, on his arrival in London, had to work his way as a physician, and he had probably little or no leisure to bestow on such an institution; but the success of the Edinburgh scheme may have stimulated him to a similar attempt in London. Accordingly, in November, 1823, he and a few friends invited general attention to the subject, and the proposal met with all the encouragement that might have been expected both from master mechanics, the workmen, and the friends of knowledge and improvement. A meeting was at once held, a subscription commenced, rules for the association were prepared, and a Mechanics' Institution was founded so promptly, that in the month of January the lectures were opened upon Mechanics, by Professor Millington, of the London Institution, and upon Chemistry, by Mr. Phillips. Nearly 1300 workmen speedily entered, paying 1*l.* each; and crowding from great distances, and in all states of the weather, after their daily toils were over, to gratify that taste for knowledge which is certainly a most cheering and characteristic feature of our age and country. Dr. Birkbeck opened the institution by an able address; and Professor Millington, in offering his services, declared with honest pride, at the close of his introductory lecture, that he had originally belonged to the same class as his audience. Temporary accommodation for the infant institution was procured in Monkwell Street, while more commodious premises were being prepared in a central situation, namely, Southampton Buildings, Chancery Lane, consisting of a spacious theatre, a lecture room, rooms for the library and apparatus, and class and reading rooms. The foundation of the theatre was laid about Christmas, 1824, and on the 8th July, in the following year, it was completed, and opened by Dr. Birkbeck, supported by his Royal Highness the Duke of Sussex, the Marquess of Lansdowne, Sir R. Wilson, Mr., (now Lord) Brougham, Messrs. Wood, Hume, Martin, and other friends of popular education. It should be stated that several thousand pounds were advanced by Dr. Birkbeck for the purchase of the house and the erection of the theatre. Sir Francis Burdett made a donation of 1000*l.*, Mr. Hobhouse of 100*l.*, and many other sums were also subscribed. Similar institutions were established in most of our great towns, and still continue to exert their beneficial influence on the children of those who were among the first members.

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* It is fortunately unnecessary at the present day to meet objections against the education of the people, for the necessity has long since been admitted, and is now being acted on. But if an answer were necessary, no better could be given than that which is furnished by the reply of Dr. Johnson to a remark that "a general diffusion of knowledge would make the vulgar rise above their sphere." "Sir," said this illustrious man, "while knowledge is a distinction, those who are possessed of it will naturally rise above those who are not. Merely to read and write was a distinction at first; but we see when reading and writing have become general, the common people keep their stations. And so, were higher attainments to become general, the effect would be the same."

One of the useful consequences of this diffusion of institutions for mechanics was the adoption of a similar plan by persons engaged, like mechanics, in the pursuits of active life, but in a higher station and in easier circumstances. Early in 1825, some young men engaged in commercial pursuits formed themselves into an association for the purposes of obtaining those advantages of education from which the habits of a busy life often exclude persons engaged in trade and commerce. The numbers that immediately joined them, at once proved the demand for the new institution; 400 members were at once enrolled; the subscription was limited to 2*l.* 2*s.*, and with the assistance of the President, Mr. John Smith, and of Messrs. John Abel Smith and George Grote, they obtained spacious premises in Aldersgate Street, and built a lecture room adjoining them. This was opened on the 24th April, 1828, with a discourse by Mr. (now Lord) Denman, at that time Common Serjeant of London.

Our limited space will not allow us to quote more than one or two brief passages from this admirable address. Speaking of the advantages of combining a literary taste with commercial pursuits, the learned speaker said :—"The very least advantage that can arise is the acquisition by great numbers of a taste for English literature. Let us pause for a moment to consider the extent and value of this alone. Ask yourselves, if any prospect of emolument would tempt you to forego it; and in observing others, contrast the man of active habits, who can devote his hours of leisure to this intellectual gratification, with him who is destitute of such a resource. Most of us have observed, in various departments of life, strong natural talents, acting with marvellous precision in some narrow round of daily employment, but from the want of general cultivation incompetent to any other effort. How lamentable a waste of time would have been reclaimed in such cases, had all the faculties been taught activity! How many starts of unseemly irritation—how many tedious hours of languor would have been avoided! How many low-thoughted cares of sordid gain—how much degrading sensual indulgence would have been changed for the purest enjoyments, at once independent and social in their nature, delighting the mind in its intervals of idleness, and bracing it for the more cheerful and effective discharge of duty!

"The character here alluded to is fast disappearing from among us, and will shortly exist in tradition only. The same degree of ignorance and intellectual apathy is from henceforth rendered impossible by the all-pervading activity of the periodical press. But we are become so familiar with the means by which the mighty machine carries on its civilising process as to be in some danger of undervaluing, if not forgetting, the service performed. Even while that great object, the extinction of unlettered barbarism, is in a rapid course of accomplishment, we are often invidiously told of what is of necessity left undone, and reminded of the poet's disparaging sarcasm against 'a little learning.' Assuredly, an ample supply is much to be desired; but a beginning must be made. The progress of accumulation is by nature slow and gradual; and the smallest portion of learning is better than none at all, partly for its own intrinsic value, and still more as the indispensable forerunner of further acquisitions."

This institution soon became a model for institutions of a similar kind in various parts of London and its suburbs, and in the provinces; and they may be said to a great extent to have taken the place of Mechanics' Institutions properly so called.

The ALDERSGATE INSTITUTION, from its foundation, conferred two kinds of benefits on its members—the library and the lectures. The advantages of a library of reference are, of course, only limited; to make books really useful, they must be read at home. Accordingly, each member was allowed two volumes at a time. The lectures were delivered once, and sometimes twice in every week. They treated of most branches of science and literature. Classes were also formed for teaching Latin, French, Spanish, Italian, and German. The first report states "that as often as any number of persons may happen to concur in attachment to any particular science, it has been the duty as well as the pleasure of the Committee to afford them the amplest facilities for studying it." Acting on the spirit of this remark, classes were formed for the study of experimental science, the use of the globes, shorthand, &c. One night in each week was also set apart for discussing historical, moral, and political questions; avoiding all subjects of a party or purely controversial nature. "The subjects considered," says the first Report, "though usually solid and scientific, have been so handled as constantly to keep alive and captivate the attention of the class. The number of members engaged in it has been unusually great; and the Committee have remarked with pleasure, how much it has instigated the members to seek the requisite previous instruction by private reading in the library. Acceptable and interesting as this class has proved, it is still more valuable from the habits which it tends to form among the members, of investigating and explaining the reasons for their opinions, and of hearing and canvassing the arguments urged by opponents."

It is not necessary to particularise the various other institutions which have been established in and about the metropolis on the model of the Aldersgate Institution. The subjoined will serve as a specimen of one of the suburban institutions.

ISLINGTON.—"The prosperity attendant upon the rapid extension of trade and commerce which followed the close of the last war, is nowhere rendered more manifest than in the altered character which Islington, in common with most of the suburban villages which begirt the metropolis, has assumed. Its elevated site, and reputation for salubrity, had previously caused it to be one of the most favoured retreats of the peaceful citizen from the turmoil of the great seat of business, into which it is now almost absorbed. Its single church, and chapel of ease, with three dissenting chapels, are now extended to about thirty places of worship of all denominations. Its numerous squares and terraces have an aspect of great elegance. It is connected by admirably constructed railways with all parts of the country, and it is expected that it will soon have the addition of a public park, for the formation of which a portion of its site offers peculiar advantages.

"Nor have the ends of benevolence, nor the gratification and advantages of literature and science been neglected. Islington is the seat of a number of charitable institutions, of elementary and classical schools upon the most liberally-extended scale; of a literary and scientific institution, which holds a high rank among establishments of a similar class; of an Athenæum where the same objects are pursued at a more moderate scale of expense; and of various reading rooms, and institutes for the operative classes.

"The LITERARY and SCIENTIFIC SOCIETY has for its objects the imparting sound instruction blended with rational entertainment. It may suffice to state, that weekly public lectures during the season, from October to May, the more retired instruction of classes for the study and practice of literary composition, elocution, and science in its various departments, a museum for the reception and preservation of specimens of natural history and mineralogy, and works of art, apparatus for philosophical experiments, an accumulating library of reference and circulation, now consisting of nearly ten thousand volumes, and monthly meetings of the members, at which written papers are read and discussed, are the chief means adopted by the Society to carry out their plans. At these meetings the introduction of politics and theology is forbidden by the rules.

"The affairs are regulated by a president, three vice-presidents, a committee of management, treasurer, two honorary secretaries, a librarian, &c.

"The Society consists of proprietary, annual, honorary, and corresponding members.

"Persons purchasing a 10*l.* share, and paying an annual subscription of 1*l.* 11*s.* 6*d.*, become joint proprietors of the Society's stock, and are all entitled to the advantages offered by the Institution. They are also qualified to vote at general meetings, are eligible to all offices, and may introduce members of their families on payment of a second subscription of 1*l.* 11*s.* 6*d.* per annum. They have also a second ticket of admission to the lectures, which is transferable.

"Annual members, on payment of a subscription of 2*l.* 2*s.* per annum, are entitled to personal admission to the reading rooms, library, museum, and lecture room, and to the use of the books and apparatus. They have also the privilege of introducing one lady, a resident member of their families, to all the personal advantages of the Institution, upon payment of a further subscription of 1*l.* 1*s.* per annum.

"Subscribers of 25*l.* and upwards, are admitted to all the privileges of annual members, without further payment, and have one transferable ticket of admission to the lectures. Honorary and corresponding members are admitted for life to all the privileges enjoyed by annual members. According to the last report, the aggregate number of members amounts to 486.

"The building, designed by Messrs. Gough and Roumieu, is situate in Wellington Street. It is in the Græco-Italian style, and occupies a frontage of 51 feet, by a depth of 78 feet. It is of a substantial character, faced throughout with cement. The principal front consists of a projecting centre, with wings, to which latter are attached entrance porches, and corridors of access to the several parts of the structure. The internal arrangements comprise a reading room, library, conversation room, museum, committee, and class rooms, laboratory, and apparatus rooms; with apartments in the basement for the housekeeper. The theatre occupies the whole of the building in the rear. The reading room comprises the front on the ground floor; its ceiling is panelled in compartments, deeply sunk and enriched, and the entablature is sustained by Ionic columns and pilasters, in imitation of Sienna marble, with white capitals and bases. The tables of this room are constantly furnished with the morning and evening papers, and the leading periodicals. It is plentifully supplied with maps and works of reference, arranged in recesses. Access to this room is obtained by means of folding doors, in the corridors at each end. Similar doors in a recess on the south side open into the conversation room, from which through spacious panels of plate glass, a view is afforded of the interior of the theatre. East of this is the librarian's office, and on the west the principal staircase. This staircase is lighted by three ground glass windows, with stained glass margins, and consists of a double flight of stone steps, leading to a lobby on the upper floor. Its ceiling is segmented, and panelled in compartments. This upper lobby, which is adorned with busts and vases, communicates with the committee room, and by a small flight of additional steps with a saloon, which occupies the entire front over the reading room, and is fitted up as a museum. The ceiling is divided into three large compartments, enriched with much elegance. Its entablature is supported by plain white double pilasters, between which are disposed cases of specimens of fossils, minerals, with zoological and other preserved objects, classed and arranged. The walls are adorned with paintings, by Pickersgill, Clint, and others; on the tables are disposed folios of prints and drawings, with other works of art.

"The theatre, the south end of which forms a semicircle, is 50 feet in diameter, and contains a continuous range of ascending seats, with backs and cushions, capable of accommodating five hundred persons. It is lighted by a raised lantern in the centre of the roof. Its ceiling is panelled, and its entablature supported by a range of pilasters, partly encased by a surbase. The front of the theatre, which forms it into an exact semicircle, and by which it is connected with the rest of the structure, is adorned in the centre with a façade of alternate Ionic columns and vases, between which are the plate-glass panels which give light to the conversation room. By sliding down these panels into grooves, this latter is converted into a gallery, forming an appendage to the theatre, on occasions of extraordinary attraction, such as concerts and other musical entertainments, with which the winter season is occasionally enlivened. Access to the theatre is obtained from the west corridor of the main building. The lower part of the theatre communicates with the philosophical class room, laboratory, and apparatus rooms. A central lobby and back stairs, with housekeeper's rooms, cellars, &c., occupy the remainder of the basement.

"The Athenæum constitutes the upper portion of a spacious building in the Upper Street, nearly opposite the church. It furnishes its privileges for a subscription of 15*s*. per annum, and is freely open to all who may be desirous of availing themselves of its advantages. It has a good supply of newspapers and other periodicals, and a library, which is in course of accumulation from the presents of its supporters; but the smallness of the subscription does not allow of any appropriation of the funds for this purpose. The members have also weekly lectures in an extremely commodious and lofty room, lighted by semicircularly arched windows, and well fitted up for the purpose. These lectures have gained a deservedly high reputation, and are for the most part gratuitously contributed by the friends of the Institution, comprising names of eminence in science and literature."

PUBLIC LIBRARIES OF LONDON.

British Museum Library, Montague Place, Russell Square.
Library of Sion College, London Wall.
Library founded by Dr. Williams, Red Cross Street, City.
Archbishop Tenison's Library, St. Martin's Place.

WITH respect to public libraries, the British metropolis is yet far behind the chief continental towns. While Paris possesses seven public libraries, accessible in every way to persons of all classes; while Dresden has four, and Florence six; while Copenhagen and Vienna have each three; and Brussels, Berlin, Milan, and Munich, each two; our own gigantic metropolis possesses only one important library (the British Museum), and that—to the disgrace of the nation—not freely open to the public. There are indeed three local libraries of some extent and value, namely, one in London Wall, City, founded by Dr. White in 1685, and called the Library of Sion College, containing nearly 40,000 volumes; one in Red Cross Street, City, founded by Dr. Williams in 1716, containing 20,000 volumes; and one in Westminster, founded by Archbishop Tenison in 1685, containing 4000 volumes. The first of these was founded expressly for the city clergy, and has only of late years been made accessible to the public on the same terms as the British Museum Library; the second requires the order of one of the trustees for admission; the third is a small and neglected library, whose reading room has been converted into a club-room. Thus there is actually no public library in the metropolis which a stranger may enter without formality in order to pursue his studies.

That the people of London are not indifferent to the advantages afforded by such institutions, is abundantly proved by their own independent efforts to supply the deficiency. The various literary and mechanics' institutions which have sprung up of late years have generally collected libraries of greater or less extent as the very groundwork of their prosperity. And even in coffee-houses, to which large numbers of the temperate working classes resort, it has been found necessary to supply the frequenters with a collection of books, in addition to the usual periodicals and newspapers. More remarkable than all is the fact, that libraries are used and valued in connection with Ragged Schools, and that the almost mendicant class of readers resorting to them, though violent and ill-conducted at first, soon acquire some habits of order, and learn to take pleasure in reading; and not only so, but they even take pleasure in the better class of books, and seem to lose their relish for the pestilent writings of the low shops, when they have once had a taste of better things.

This desire after knowledge, so extensively manifested among the people, taken in connection with the general tendency among publishers to increase the number of popular works, cheap in price, condensed in form, and valuable in substance, seems at once to point to the present period as that in which our country might most properly and easily accomplish the formation of Public Libraries. In the opinion of competent judges, the establishment of such depositories of standard literature would lessen, or perhaps entirely destroy, the influence of frivolous, unsound, and dangerous works. And in order to the establishment of such libraries, the great desideratum is, not so much the objects to be deposited, as the depository itself; for it is highly probable that, if buildings devoted to the purposes of a library or museum existed, and if the institutions for which they were erected were fully secured in some corporate body, and exempted from burthens in the way of taxation, then the furnishing such buildings with books would very easily and in many cases gratuitously be supplied. Bequests of books would be oftener made, and the overflowings of many a private library would be given, if there were only suitable depositories, accessible to the public, in which such gifts might be made available to the general good. Many a private collector of books, tempted by fine editions of standard works, is apt to load his shelves with duplicates, and even triplicates of the same work. In such cases he would often be glad to benefit his neighbours and the public by transferring his superfluous copies to the nearest public library. Indeed, in the British Museum itself the number of duplicate and triplicate copies is stated to amount to 52,000. What better use could be made of these than to furnish other libraries, or, at the least, to form the commencement of a lending library—which is much wanted to make the British Museum Library complete? In the report of the select committee of the House of Commons, published in 1849, it is strongly recommended that the public libraries of the metropolis should not only be increased in number, but should include lending libraries, and should be also made more valuable to the working classes by being open in the evening. M. Guizot testifies to the success which has attended this experiment as tried at Paris, Rouen, and Orleans. And the committee justly observe, "Libraries are now closed during the very hours when the suspension of bodily labour and of business leaves leisure for the cultivation of the mind. It has indeed been objected that gas-lighting is indispensable, and that gas-lighting will spoil the books. Your committee are of opinion not only that a powerful light, and a light not requiring to be moved about, is the fittest and the safest light for a public library, but that it is possible to obviate or prevent the noxious effects of gas upon the books. Mr. Imry, a gentleman generally conversant with this subject (and especially conversant with the mode of lighting the House of Commons), is decidedly of this opinion. It appears that libraries in the United States (where they are always open in the evening) are lighted with gas without damage to the books. Precautions should be taken to secure every library against fire. It is not, however, from the books (as is generally supposed) that the principal danger arises. Books, as they stand in a library, are not easily burnt. Any one who attempted to burn an unopened book would find that he had undertaken no easy task. The principal danger of fire arises from the fittings and the furniture being of wood. Not only, therefore, should the building, if possible, be fire-proof, but the shelves and the furniture should be of iron. Whatever excess this might cause in the outlay, will be repaid in the safety of the books, and the durability of the materials."

In the same admirable report the subject of catalogues for libraries is also dwelt on, and the inadequate supply of printed catalogues in this country is noticed. It is maintained, that not only should catalogues be printed and published, but all new works should be rapidly entered-up in them. "It would appear that this has not been done with requisite celerity at the British Museum. The consequence is, that a book which has been published three years may not be procurable, because it has not yet been entered in the catalogue." The committee recommend as the best form of catalogue one that is classified as to subjects, with an alphabetical list of authors. "It is evident that, till good printed catalogues exist, much time will be lost in the wearisome search for books in every library*. Until a nation possesses a good system of catalogues, it cannot know the extent of the literary wealth which it possesses. In all the great libraries of deposit there should not only be a collection of all the catalogues of libraries existing in the country, but so far as possible a collection of the catalogues of all the libraries in the world. A great library should, in fact, contain within it a library of catalogues. On a subject of so much importance as the intellectual treasures of different countries, constant literary intercourse should be maintained; and there should be an international exchange of catalogues."

The inquiries of this committee will, it is hoped, draw general attention to the state of literary darkness prevailing over a large portion of the metropolis, especially over the newer portions. The vast populations of Pimlico, Marylebone, Finsbury, and Southwark have no public library. The city, and the neighbourhood of the British Museum, are the parts of London best supplied. To advert more particularly to the four existing libraries already referred to:—

The British Museum Library contains 500,000 volumes, and is privileged to claim a copy of every new work published in Great Britain. The mode of entrance is by a recommendation from some person of known standing, vouching for the respectability of the applicant. The origin and regulations of this library are described elsewhere. (See "British Museum.")

The Library of Sion College was, in the first place, founded as a row of almshouses by the rector of St. Dunstan's in the West, Dr. White; but a few years later, Mr. Simpson, another rector in the City of London, built a library over it, in which he put his own books, and which was afterwards enriched by many donations. The library was at first intended for the sole use of the city clergy, but it is now easily accessible by the public, for every incumbent in the city, or in a parish whose mother church is in the city, has a right to introduce by note any reader for a twelvemonth. A discretionary power is also given to the librarian to allow any qualified person to consult the library.

This library had originally a grant of books under the copyright act, and therefore received books from authors on their publication; but this privilege was exchanged for a grant under the Compensation Copyright Act of 1837. The public money received in consequence of that compensation is 362*l.* 15*s.* 2*d.* per annum, which is spent in purchasing books. The library consists of a large proportion of theological books, but is rich also in historical works, and in books of ancient science; it has also some valuable early printed books. A great advantage of this library is that it is a lending library. About 5000 or 6000 volumes are taken from the library and returned in the course of the year. They are lent out on the responsibility of Fellows, and at their order. The readers at this library at any one time seldom exceed six or seven, while there is a space in the reading-room to accommodate 200. The funds of this establishment, arising from lands in Essex and Hertfordshire, and a few houses in London, are in such an unsatisfactory condition that the small salary allotted to the sole librarian and secretary, the Reverend Henry Christmas, M.A., F.R.S., &c., is not any longer guaranteed by the council.

Dr. Williams's Library in Red Cross Street, City, is very little used, except by dissenting ministers. Not more than fifty or sixty readers in the whole course of a year are found in its reading-room, which could accommodate that number at one sitting. It is essentially a theological library, and the books are lent out by an order from a trustee, who is then responsible for their safety.

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* If the Government were to publicly advertise for tenders for the making of a finding and classified catalogue, practical men would come forward, and one would be made within a period satisfactory to the public requirements; and this would be done while others are brooding over the jesuitism of their position.—Ed.

Very small funds are at the disposal of the managers, therefore very few additions are made to its contents. Dr. Williams was a non-conformist divine of the Presbyterian denomination; and a part of his library consists of interesting manuscripts connected with the early history of the Reformation. There are also curious old black-letter theological works, and scarce puritanical tracts. The librarian has a discretionary power to allow any person freely to consult the works in this library, without an order from the trustees, which was formerly necessary, and which is still required if the book is to be lent.

Archbishop Tenison's Library was founded by Dr. Thomas Tenison, some time Vicar of St. Martin's, and afterwards Archbishop of Canterbury. It was designed for the public, but especially for the clergy of the City of Westminster and other studious persons. This library is not by any means confined to theological subjects, but comprises works of general literature. The whole ought to be made available to the public, according to the intention of the founder. But this privilege having been at one time withheld, the interest of the parishioners and others in this library gradually decreased, and it is now scarcely at all frequented on its own account, although the trustees have permitted a subscription society to hold its meetings, to play at chess, and read newspapers in the reading-room, and thus have ensured guests, but not of the sort, or for the purposes intended by the founder. Thus a sort of Mechanics' Institution or Club holds its meetings in Archbishop Tenison's Library, and a list of lectures is posted outside the door. A portion even of the shelves of the old library has been appropriated to the books of this new society; and if clergy and "studious persons," more especially intended by the founder, were to resort to Tenison's library for purposes of study, they would soon give up the attempt in despair. A memorial on the subject of this grievance has indeed been signed by several of the clergy and studious persons within the district, and will doubtless receive from the trustees the attention which it deserves. A late eminent bookseller gave the following testimony as to the state of the original library. "The books and manuscripts in the library are many of them of great curiosity, rarity, and value, but have suffered injury from dust and neglect; were they properly cleaned and repaired, and the room made comfortable to readers, it would, in my opinion, be much frequented, and accessions be made to the library in the way of books presented."

LIBRARY AND MUSEUM OF THE EAST INDIA COMPANY, EAST INDIA HOUSE, LEADENHALL STREET.

The Library and Museum of the East India Company occupy the north-east wing of the India House. The former is contained in apartments on the upper and middle stories, and comprises two divisions, one consisting of Manuscripts, one of Printed Books. The latter collection is not very extensive, being restricted to publications relating to the history and geography of the Eastern hemisphere, to works treating of the history and commerce of the East India Company, and their administration of the government of India, and to books in the oriental languages or on the subject of Asiatic literature, printed either in Europe or in India. Although not complete, yet the collections in these departments are interesting and unique, and contain a number of works that will be looked for in vain in any other public library. There is an extensive collection of tracts relating to the Company, and a valuable assemblage of books, drawings, and prints, illustrative of the people, scenery, and antiquities of various

Asiatic countries. The manuscript department of the library is unrivalled in several important branches. The Sanscrit manuscripts, consisting of collections made in India by Colebrooke, Taylor, Leyden, Mackenzie, Wilkins, and other eminent scholars, extend to more than 3000 bound volumes, besides a considerable number written on palm leaves. Of the latter description there are also a number in Burmese and other languages of the Archipelago. There is likewise a collection of Chinese printed works, and a copy of the great cyclopedic aggregate of Tibetan literature, contained in upwards of 300 large oblong volumes, printed with wooden blocks on the paper of the country. There is but one other set of this work in Europe—in the National Library of France, both having been procured by Mr. Hodgson when political resident at Nepal, and presented by him to the libraries where they are deposited. Another principal division of the manuscript library consists of Arabic and Persian manuscripts. It is equally extensive with the Sanscrit, including many rare and curious, and some handsomely illustrated volumes, especially of the Koran and of the Shah Nama, or Book of Kings, of Firdusi. Amongst the curiosities are miniature copies of the Koran, one of which is the autograph of Shah Alem, King of Dehli. Another copy of the Koran, which is written in old Kufic characters, is said to be one of the seven original copies which were compiled and written out by the Khalif Othman, who died A.D. 655. It is of undoubted antiquity. These volumes were collected in India by distinguished servants of the Company, and many belonged to the library of Tipu Sultan, having been presented to the Company's library by the captors of Seringapatam.

Museum.—In the same apartments with the books and manuscripts are various objects of literary, artistic, or ethnographic interest. One of these is a marble slab, containing one of the most perfect specimens of cuneiform inscriptions yet found. It was procured by Sir Hartford Jones, at Bagdad, and presented to Sir Hugh Inglis, by whom it was placed in the museum. It has not been deciphered. In the room with the printed books are copies of the paintings on the roofs and walls of the excavated temples of the Ajunta Pass—works not later than the beginning of the Christian æra, and probably a century earlier—affording interesting illustrations of the manners and costume of the period, and of the prevalence of Buddhism. They are also remarkable as works of art at so remote a date. There is also a collection of Hindu and other idols, of oriental arms and ornaments, and of the reliques and curiosities found in the Topes of Afghanistan. There are some handsome models of the Chinese *beau ideal* of country villas, and the piece of mechanism known as "Tipu's tiger," a wooden figure of a tiger tearing to pieces a man in the uniform of an English Sipahi, and so contrived as to imitate the cries of the man and grunt of the tiger. It was found in the palace of Seringapatam, and was a toy constructed to gratify the hatred which Tipu entertained for his English enemies.

In adjacent passages and apartments are models of boats and instruments of various kinds, of the city of Lahore, and figures illustrating the manners and usages of the people of India and other Asiatic regions. Also dresses, arms, and ornaments, some of Indian, some of Malay or Javanese, and some of Abyssinian origin.

Beyond these passages an apartment is appropriated to subjects of natural history, containing stuffed specimens of the animals and birds of India and the Archipelago, with a few remarkable specimens from Abyssinia. The ornithological collection is very extensive and complete. There is also an entomological collection of very great extent and interest, based upon a collection formed originally in Java, by Dr. Horsfield, and since enlarged by contributions from other oriental sources. The collection, considered with respect to its topographical limits, is unrivalled. The museum has latterly been made to include also a spacious apartment on the basement story, in which a more miscellaneous variety of objects is assembled, comprising Hindu images and specimens of sculpture, a state palankeen and elephant seat and trappings captured at Bhurtpore, Chinese lanterns, a model of the car of Jagannath, and of one of the bhaulis or large wells of Hindustan, and a well-preserved series of the cases enshrining an Egyptian mummy. The main feature, however, of this room is a large collection of extraordinary fossil remains, disinterred from the Sewali hills, or the first ranges of the Himalaya, by the labours of Colonel Cautley and Major Baker, and described chiefly by Dr. Falconer. They were brought home by these officers, and presented partly to the British Museum, and partly to the museum of the Company. They comprise a variety of animals, principally of the genera Elephas and Mastodon, presenting the skulls, teeth, and other bones of many species now extinct—either the original specimens, or casts from those in the British Museum. There are also the bones and casts of the head and limbs of the Sivatherium, an entirely new fossil genus, discovered by Messrs Cautley and Falconer, and the skull of an extinct species of rhinoceros, the most perfect that is known. But, the most striking object is a cast of the restored shell, upper and lower, of the gigantic tortoise, made up from the fossil bones actually found and divided between the Company's and the British Museum. A variety of other articles of a similar description, a collection of eastern mammalia, and one of Indian fishes, are also contained in this apartment.

The library and museum are under the control of Professor H. H. Wilson, the librarian; but the latter has also its especial curator, Dr. Horsfield. The library and museum are open to students every weekday from 10 to 4, upon permission from the librarian or curator, or under the authority of any member of the Court of Directors. They are open on Mondays and Thursdays, between the same hours, to visitors who are provided with tickets of admission from the members of the Court or other authorities. On every Saturday persons are admitted without tickets, on giving their name and address to the clerk. The library and museum are closed to visitors during the month of September.

The following is a list of LIBRARIES in the metropolis and its immediate suburbs; but it is necessary for a person, in order to read the books, either to be specially recommended by some well-known responsible person, or, as happens in the majority of cases, to become a member of the institution to which the particular library belongs:—

Antiquarian Society, Somerset House.
Beaumont Philosophical Institution, 32 to 37, Beaumont Square.
Botanical Society of London, 20, Bedford Street, Covent Garden.
British Museum, entrance in Montague Place, Russell Square.
British and Foreign Bible Society, 10, Earl Street, Blackfriars.
Charter House, Charter House Square.
Chelsea Hospital.
Church Missionary College, 12, Barnsbury Place, Islington.
City Library, Guildhall.
City of London Literary and Scientific Institution, 165, Aldersgate Street.
Clockmakers' Company, King's Head, Poultry.
College of Advocates, Doctors' Commons.
College of Surgeons, 40 to 42, Lincoln's Inn Fields (medical).
Congregational Library, 4, Blomfield Street, Finsbury.
Crosby Hall Literary and Scientific Institution, 32, Bishopsgate Within.
Dr. Williams's Library, 49, Redcross Street, Cripplegate.
Dutch Church, Austin Friars. (MSS.)
Eastern Literary and Scientific Institution, Commercial Road East.
East India House, Leadenhall Street.
Geological Society, Somerset House.
Gray's Inn, South Square, Gray's Inn.
Greenwich Hospital, Greenwich.
Greenwich Institution, Greenwich.
Guy's Hospital, St. Thomas's Street, Borough (medical).
Hammersmith Institution, Hammersmith.
Hebrew, Duke's Place, Aldgate.
Heralds', Bennet's Hill, Doctors' Commons.
House of Commons, Westminster.
House of Lords, Westminster.
Incorporated Law Society, 106, Chancery Lane.
Inner Temple, 3, Tanfield Court, Temple.
Institution of Civil Engineers, 25, Great George Street, Westminster.
Islington Literary and Scientific Institution, Wellington Street, Upper Street.
King's College, 160, Strand.
Lambeth Palace, Lambeth.
Lincoln's Inn New Hall, Lincoln's Inn.
Linnæan Society, 32, Soho Square.
London Library, 12, St James's Square.
London Institution, 11 and 12, Finsbury Circus.
London Mechanics' Institution, 29, Southampton Buildings.
Marylebone Institution, 17, Edward Street, Portman Square.
Medical Society, 3, Bolt Court, Fleet Street.
Merchant Tailors' School, 6, Suffolk Lane, Cannon Street.
Middle Temple, Garden Court, Temple.
New College, North of Regent's Park; uniting the Colleges of Coward, Highbury, and Homerton.
Poplar Institution, East India Road.
Royal Academy of Arts, Trafalgar Square.
Royal Agricultural Society, 12, Hanover Square.
Royal Asiatic Society, 14, Grafton Street.
Royal Astronomical Society, Somerset House.
Royal College of Physicians, 13, Pall Mall East.
Royal Geographical Society, 3, Waterloo Place.
Royal Institute of British Architects, 16, Grosvenor Street.
Royal Institution, 21, Albemarle Street.
Royal Kensington Literary and Scientific Institution, Kensington.
Royal Medical and Chirurgical Society, 53, Berners Street.
Royal Observatory, Greenwich.
Royal Polytechnic Association, 5, Cavendish Square.
Royal Society, Somerset House.
Royal Society of Literature, 4, St. Martin's Place.
Russell Institution, 55, Great Coram Street.
St. Bartholomew's Hospital, Smithfield (medical).
St. Martin's (Archbishop Tenison's) Public Library, 42, Castle Street, Leicester Square.
St. Paul's, St. Paul's Cathedral.
Sion College, London Wall.
Soane Museum, 13, Lincoln's Inn Fields.
Society of Arts, John Street, Adelphi.
Southwark Literary Institution, 8, Portland Place, Borough Road.
Statistical Society, 12, St. James's Square.
Stepney College, Stepney.
Sussex Hall, Leadenhall Street.
United Service Institution, Whitehall Yard.
University College, Gower Street.
Veterinary College, Great College Street, Camden Town.
Welsh School, Calthorpe Place. (MSS.)
Westminster, Dean's Yard, Westminster.
Westminster Literary and Scientific Institution, 6 and 7, Great Smith Street.
Woolwich Institution, Woolwich.
Zoological Society, Regent's Park.

LUNATIC ASYLUMS.

LONDON has but two public asylums for the insane, namely, St. Luke's, situated in Old Street, near the City Road, on the north side of the metropolis, and Bethlem, situated in the Lambeth Road, on the south side.

St. Luke's Hospital was instituted in 1751, to receive poor insane persons, being paupers or others, and is adapted to contain about 300 patients. A system of non-restraint upon the unfortunate inmates is professed, but not properly observed, and the details of the management do not appear to be recommended to our notice by any distinguishing feature of improvement or success.

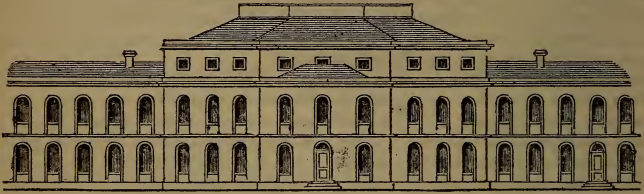
Bethlem Hospital was founded in 1547, and the early treatment of the miserable creatures committed to its brutal rulers, appears to have been characterised by utter indifference to the feelings and comforts of the patients, and a studied aggravation of their miseries. Indeed, to our shame be it recorded, these miseries were made the materials for actual *profit* to the hospital; a sum of about 400*l.* being annually collected by exhibiting the poor maniacs, chiefly naked, and uniformly chained to the walls of their dungeons. and by exciting them to the most violent manifestations of their maladies, This practice of showing the patients, like wild beasts, was abolished in 1770, but the abolition was unaccompanied by any other improvement in their treatment. Recently, however, the unfortunate lunatics have been more humanely treated, as will be seen in the following pages.

The Middlesex County Lunatic Asylum.—This institution is distant from London about 8½ miles, is situate at Hanwell, and owes its origin to the act of the 48th George III., cap. 96, and was completed under the act of the 9th George IV., cap. 40. This act was passed to enable the justices of the several counties to erect asylums for the reception and maintenance of the insane and lunatic poor, and to improve and ameliorate the condition of lunatics. Although these acts were not compulsory, the magistrates of Middlesex lost no time in taking the necessary steps to secure to this bereaved portion of the inhabitants of the county the full benefit of their benevolent provisions; and immediately appointed a committee to take all necessary preliminary measures with respect to the site and building, with a view to rescuing them as speedily as possible from the neglect and inattention of the workhouse, or the cupidity, ignorance, and cruelty, too often practised by those who farmed them in private asylums.

The site is bounded on the north by the high road leading to Uxbridge, and on the south by the Grand Junction Canal; and has the advantages of a dry gravelly soil, a pure atmosphere, and a plentiful supply of water. Architecturally, the building presents nothing more than simple plainness; but the large front airing-grounds, to which the patients have access daily, the shrubberies, gravel-walks, sun-shades, fountain and bowling-green, and other requisites, are all indicative of comfort and order within.

The asylum was erected in the years 1829 and 1830, and opened for the reception of patients on May 16, 1831. Owing, however, to the imperfect lunatic returns at that period, the committee considered accommodation for 300 patients would be sufficient for the county; and after making choice of the best of three plans, for which they had offered premiums, they accordingly contracted with Mr. William Cubitt for a building and offices to that extent, for 63,000*l.* This limited accommodation was soon found totally inadequate to accomplish the end in view; and the asylum has been consequently enlarged from time to time, and now contains 965 patients, and 97 resident officers and servants. The cost of 84 acres of land for the purposes of the asylum has been 19,267*l.* 6*s.* 4*d.*, and that of the building and offices about 160,776*l.* 14*s.* 5*d.*, making a total of 180,044*l.* 9*d.*

Nothing can more strongly mark the progress which society has made within the last fifty or sixty years, than the different aspect under which the insane have been viewed, and the different way in which they have been treated. Formerly there was but little difference in the treatment of the criminal and the insane. What advantage there was, was on the side of the criminal. He was punished for a crime, and under the authority of the law; the other was visited with a lengthened punishment for no crime, and subjected to the control of one whose brutal will, perhaps, was his only law. The law afforded no adequate protection to those who, by the loss of reason, were unable to protect themselves. Their very misfortune seemed to shut them out from all sympathy with those who possessed the light of reason. Who ever thought of applying himself to better the condition of the insane? There was one man, however, Pinel, an intelligent and noble-hearted Frenchman, who in 1792, in the midst of surrounding horrors, brought commiseration and kindness within the walls of a lunatic asylum. We owe to his courage and humanity the many beneficial changes which have been brought about in this country in the treatment of the insane; he has the distinguished honour of having instructed the nations of Europe practically in the Christian duty of dealing out to the insane the same measure of mercy which we ourselves should desire were we to be similarly afflicted.



HANWELL LUNATIC ASYLUM.

In this country, long after the example which Pinel had set, though there were isolated attempts to introduce a humane system of management into asylums, they were the exceptions only. Cruelties of the most revolting kind continued to be practised by sordid unprincipled men. The law threw not its protection round the insane; their sufferings, when known, were unheeded, because they were supposed to be for the most part unavoidable. It was believed that the insane could only be ruled by brute force; and therefore brute force continued to be the rule, and enlightened humanity the exception.

But this scandal to a Christian country was gradually to be removed, as the spirit of inquiry was awakened and sounder principles prevailed.

Almost the first and certainly the greatest benefit conferred upon the insane pauper, was the act of the 9th George IV., cap. 40, which was intended to facilitate the erection of county lunatic asylums for the poor, and to improve the condition of lunatics. Thenceforth, in those counties that wisely took advantage of the act, the friends of the insane pauper could be assured of that which the laws of society are bound to afford, protection against cruelty, and security against neglect.

On the completion of the asylum, the committee appointed Dr. and Mrs. Ellis to be the superintendent and matron. Dr. Ellis was a man who from his experience of some years as the physician of the Wakefield Asylum, in the county of York, and from his active habits of life, was well qualified to put the machine in working order, and to see that it worked well; and Mrs. Ellis, the matron, brought to the office talents of a superior order; and from both the institution derived great benefit during the time of their remaining there.

Among the useful suggestions for which the asylum was indebted to Dr. and Mrs. Ellis, was the extensive employment of the patients. In his very first report, he mentions that considerable amelioration had taken place in the condition of the insane poor of the county, and adds, "but with even the greatest solicitude for their comfort, the want of sufficient air and exercise, which can only be obtained in a large building with ample grounds, presents the most formidable obstacle to their cure;" and in December 1832, says that the system for employing them has been pursued most perseveringly in every variety of work adapted to their respective qualifications. Then, as if anxious to relieve the public mind from all ungrounded fears, and to accustom it to more humane and rational sentiments, he concludes by saying that not a single accident had occurred from the patients having been trusted with the tools used in their different occupations. These, among other less formidable weapons, were spades, bill-hooks, and scythes. The right spirit which Dr. Ellis displayed in these and similar remarks seems to be the germ of that principle which, when brought practically to bear, has since ended in the abolition of all mechanical restraints.

The same earnest endeavours to employ the patients in useful handicraft labour continued to engage his active mind during the time that he remained at the asylum. At the same time the non-restraint system was gradually making its way, by the exertions of intelligent men, in two or three other public establishments of the kingdom, and was to some extent adopted in a few amongst the best conducted private establishments. To Sir William and Lady Ellis the praise is certainly due of having prepared the way for the crowning, though difficult task, which was afterwards successfully undertaken by Dr. Conolly. By the humane and judicious conduct of Sir William Ellis, he was the pioneer who prepared the way for the removal of those deep-rooted prejudices which had well nigh opposed a fatal barrier to much of the comfort and to the possible recovery of the insane. By his exertions he gave the establishment (to a certain extent) the appearance of a little independent colony, rather than that of a sick hospital, by making each one take a share in promoting the general welfare. These were the endeavours of Sir William Ellis; and though from the imperfect system and instruments he had to work with, it was not possible fully to carry them out, they entitle his memory to honour.

The resignation of Sir William and Lady Ellis, in 1838, was at the time felt as a great loss to the asylum; for under their direction the institution had made considerable advance towards that point when another system, founded on more enlarged principles, could be successfully introduced.

In the choice of their successors the visiting justices were not fortunate. The physician continued at the asylum about a year, and the matron only a few months.

To the election of Dr. Conolly, the asylum is mainly indebted for the full establishment of the humane and eminently rational system of non-restraint; but without the zealous assistance of the other officers, this could not have been effected.

Dr. Conolly saw that the forcible restraint of refractory patients did, in fact, create many of the outrages and dangers they were designed to subdue; and in his first report instanced the better practice pursued at the Lincoln Asylum, where for three years, and with 150 patients, there had been no restraint whatever. He did not presume to say that strong restraints might never be required, but pointed to the example of Lincoln as a successful attempt to do without.

In the soundness of these views the visiting justices concurred. They were forcibly struck with the many considerations which would render such a humane system of management eminently desirable, if it were practicable. But at the same time that they felt the force of the reasoning, they could not look without deep anxiety at the progress of the experiment which had so many serious obstacles to contend with.

They were, however, soon satisfied that the danger of non-restraint was not near so great as that which was the result of exasperating the insane by the application of mechanical force; and that there was comparatively but little danger where gentleness, and the constant attention of ward attendants in sufficient numbers, were substituted instead.

In his last report Dr. Conolly says, "The great and only real substitute for restraint is invariable kindness. This feeling must animate every person employed in every duty to be performed. Constant superintendence and care, constant forbearance and command of temper, and a never-failing attention to the comfort of the patients, to their clothing, their food, their personal cleanliness, their occupations, their recreations—these are but so many different ways in which such kindness shows itself; and these will be found to produce results beyond the general expectation of those who persevere in their application."

In the same report he says, "The whole of this subject occupied so much of my earlier reports (1839 to 1844) that trusting such particular allusion to it as I have made on this occasion will be considered excusable, it is probable that I may seek no further opportunity of enforcing views which my experience continually confirms. For my own part, in what has been undertaken, or in what has been accomplished, I trust I have never shown a desire to overstate it. I have always acknowledged myself indebted to Dr. Charlesworth, and to Mr. Hill (of Lincoln), for the original suggestion of managing the insane without restraint. The magistrates of Middlesex gave me, ten years ago, the opportunity of attempting this on the greatest scale; and they have honoured me, in all those years, with their steady support. In relation to the great principle of non-restraint, I owe much to the assistance of many able officers, who have devoted themselves to overcoming many incidental difficulties. Above all, I have never forgotten on what higher aid the success of all human attempts to accomplish good depends."

The preceding is a brief account of the more important circumstances connected with the history of the institution; and the reader is now referred to the engraving, which shows the general arrangement of the interior as well as out-offices.

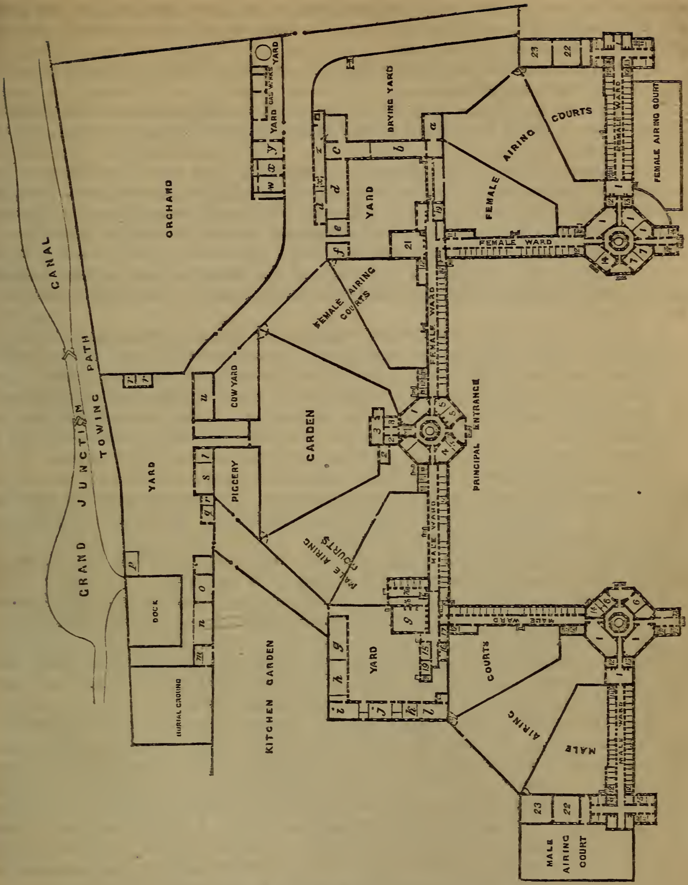
The wards are provided with day-rooms, in which the patients take their meals; these rooms have open fire-places, which adds much to the comfort of the unemployed, who spend the greater part of their time in the wards. The asylum is well furnished with baths; and each ward has a room fitted up with a row of washing-basins, which are accessible to the quiet patients at all hours of the day.

The wards have not less than two attendants in each, in some there are three; and, on an average, about fifty convalescent patients are under the care of two attendants; but in the refractory wards two attendants have the charge of about 25 patients. The attendants have to pay strict attention to the directions of the medical officers, as regards the treatment, employment, amusement, and exercise of the patients. They have to see that their patients are kept clean, and as neat as circumstances will permit, and in every instance are required to treat them with the greatest kindness.

Independent of the wards of the asylum, there are kitchen, sculleries, larder, dairy, washhouses, and laundries. The out-offices are, bakehouse, brewhouse, and general store-room. The clerks' office is at the entrance of the asylum. There are separate workshops for the various trades, namely, upholsterers, printers, tailors, shoemakers, carpenters, tinmen, plumbers, and smiths. There is also a steam-engine for raising water into the building, and gas-works for lighting.

The government of the asylum is placed under the control of a committee of justices of the peace of the county; they meet usually about once a fortnight, at the asylum. The medical and other journals are then examined, and signed by the chairman; they see the patients which may have been admitted since their last meeting; and all patients to be discharged as cured, or on trial, are brought before them; they also hear and determine any complaint that may be made against any officer or servant; and generally perform such duties as are required for carrying into effect the Act of the 8th and 9th Vict., cap. 126.

There is also a sub-committee, appointed by the general committee. They


CANAL
GRAND JUNCTION
TOWING PATH
ORCHARD
YARD
GAS WORKS YARD
YARD
DRYING YARD
YARD
FEMALE AIRING COURTS
FEMALE AIRING COURTS
FEMALE AIRING COURT
FEMALE WARD
FEMALE WARD
FEMALE WARD
COW YARD
GARDEN
PIGGERY
PRINCIPAL ENTRANCE
MALE WARD
MALE WARD
MALE AIRING COURTS
DOCK
BURIAL GROUND
KITCHEN GARDEN
YARD
MALE WARD
COURTS
AIRING
MALE
MALE AIRING COURT
21
22
23
22
23

GROUND PLAN OF HANWELL LUNATIC ASYLUM.

REFERENCES TO BUILDINGS.

1. Day rooms.
2. Dispensaries.
3. Committee room.
4. Dining room.
5. Matron's apartmts.
6. Surgeon's rooms (male side).
7. Surgeon's rooms (female side).
8. Study.
9. Kitchen.
10. Water closets.
11. Sink rooms.
12. Attendants' rooms.
13. Bath rooms.
14. Visitors' rooms.
15. Steward's room.
16. Housekeeper's do.
17. Do. store room.
18. Scullery.
19. Servants' hall.
20. Male infirmary.
21. 24-bedded room.
22. Foul-linen wash-house.
23. Foul-linen yards.

REFERENCES TO OUTBUILDINGS.

a. Work room.
b. Laundry.
c. Drying room.
d. General washhouse.
e. Officers' do.
f. Officers' laundry.
g. Bakehouse.
h. Brewhouse.
i. General store room.
j. Tailor&shoemaker.
k. Printer.
l. Upholsterer.
m. Dead house.
n. Coal shed.
o. Seed room.
p. Coachhouse, &c.
q. Stable.
r. Tinman's shop.
s. Carpenter's shop.
t. Plumber's shop.
u. Cowhouse.
v. Poultry house.
w. Well house.
x. Engineer's store room.
y. Smith's shop.
z. Engine and boiler house.

examine the weekly and other returns, inspect the food, see that the contracts are duly performed, and inquire into the state of particular patients and the general condition of the asylum.

A list of the officers is given in Table II., and the heads of their respective duties are nearly as follows:—

The visiting physician attends at the asylum and examines the patients three times a week, and gives such directions as he considers necessary for their welfare.

The management of the patients, as regards their classification, employment, and treatment, is under the direction of the two resident medical officers, one for the male, and the other for the female department. The dispenser makes up the medicines, and otherwise assists the medical officers.

The chaplain celebrates divine service twice on Sundays, and reads prayers every morning and evening in the week, in the chapel of the asylum, to such patients as are able to attend; and performs such other clerical duties as may be required.

It is the duty of the matron to superintend the domestic management of the asylum where females are employed; to see that all female officers, ward attendants and servants are diligent in the performance of their duties; that all orders as to the classification, employment, amusements, and management of the female patients, as well as the directions of the medical officers, be duly performed. The assistant-matron is under the control and direction of the matron, and assists her generally in the performance of her duties.

All supplies of provisions, clothing, and stores, are received and accounted for by the steward, who is also the store-keeper. He superintends the brewing and baking department; and, under the direction of the House Committee, manages the grounds, gardens, and farm.

The clerk of the asylum keeps the cash accounts, registers, and all documents relating to the admission and discharge of patients.

The resident engineer superintends the repairs of the asylum, and has the care of the gas-works, steam-engine, warming apparatus, and other machinery.

The superintendent of the bazaar has the care of those female patients, during the daytime, who are desirous of amusing themselves with fancy and useful needlework, reading, or music. The profit arising from the sale of their work to visitors is expended in little extra indulgences.

There is a school for the male patients: among those who attend, many are unable to employ themselves usefully about the establishment. They have morning and afternoon classes daily; the patients who are engaged in labour during the day have a weekly evening writing class; there is also a singing class in the chapel, where both male and female patients attend in considerable numbers. The schoolmaster occasionally gives a lecture in the evening on natural objects, such as plants, animals, and other amusing subjects. The lectures are sometimes illustrated by aid of a magic lantern; and the patients present on these occasions take great interest in such entertainments.

The amusements for the patients are varied. In the wards, a good supply of books, periodicals, bagatelle boards, draughts, dominoes, and cards, is kept up. A few of the patients amuse themselves with drawing and painting, and decorating their rooms; in some of the wards there are also pianofortes, which have been presented by visitors for the use of those patients who are musically inclined.

The assembling of the patients at stated times in the large front airing grounds, or in the wards of the asylum, for the enjoyment of music and dancing, and the little extra indulgences then allowed, is looked forward to with no small degree of pleasure.

The asylum is supplied with water from an artesian well, which is considered to be the best in the kingdom. The shaft, to a depth of 31 ft., is 10 ft. in diameter, and thence to a further depth of 209 ft., 6 ft. in diameter, together, 240 ft.; the whole of which is constructed of brickwork in cement. The boring was commenced at the bottom of the shaft, with pipes of 14 in. internal diameter; these are carried down about 50 ft., into a stratum of flint stones overlaying the chalk formation, making the whole depth from the surface about 290 ft., whence the water rises into a tank, 20 ft. above the ground-floor of the asylum, without the aid of pumps, at the ratio of 90,000 gallons per diem. The strata through which the well is sunk and bored are as follows:—vegetable soil, 1 ft. 6 in.; gravel, 7 ft.; sand, 2 ft. 6 in.; gravel and sand. 9 ft.; brick clay, 2 ft.; blue, or London clay, 169 ft.; indurated mud, sand, and clay, with pieces of wood and shells imbedded, 24 ft.; pebbles and shells, 3 ft.; plastic clay, 22 ft.; sand, 2 ft.; plastic clay, 14 ft.; indurated mud, sand, and clay, 8 ft.; dark brown clay, 9 ft.; green sand and clay, 7 ft.; oyster bed, 2 ft. 9 in.; pebbles and yellow clay, 2 ft. 3 in.; bed of flint stones, into which the bore is carried, 5 ft.

The temperature of the water, as it overflows the surface, is 55° of Fahrenheit.

The analysis of the water, as made in 1845, was:—

	Grains.
Carbonate of lime	0·27
Chloride of sodium	1·52
Sulphate of soda	4·51
Phosphate of lime	0·28
Grains in an imperial pint	6·58

The Adelaide Fund.—The interest of this fund is appropriated to the relief of patients who, when cured, are discharged from the asylum.

The fund originated in 1835, with the superintendent, Sir William Ellis, who suggested it to Colonel Clitherow, for many years the esteemed chairman of the asylum. From the late *Queen Adelaide* he received a donation of 100*l.*, with a generous permission to profit by her royal patronage, and to distinguish the charity as "*The Adelaide Fund.*" At that period, by kind assistance, a sum of 2000*l.*, 3 per cent. consols, was obtained. The increase of patients rendering additional resources desirable, in 1840 efforts were made by Mr. Serjeant Adams and other active magistrates to extend the permanent resources, and among other donations was that of Her Gracious Majesty the Queen of 100*l.* On that occasion another application was made to the Queen Dowager, who then began an annual subscription of 25*l.*, and benevolently and punctually continued such assistance until her death. A fund of 5300*l.* 3 per cent. consols had been accumulated up to 1846. And now, by a legacy under the will of Miss Mary Phillips, deceased, and certain proceedings taken in the Court of Chancery, and an order made thereon, during the present year, the further sums of 5644*l.* 17*s.* 2*d.*, 3 *per cent.*, and 2136*l.* 5*s.* 2*d.*, 3 *per cent. reduced annuities*, have been added to the former amount of the fund.

In conclusion, it may safely be said that this institution will ever stand high in the estimation of all those who feel for suffering humanity, on account of the ameliorating system pursued with regard to the treatment of its unfortunate inmates; but the greater portion of the asylum having been erected upwards of 20 years, it may not be surprising if many defects in construction be found to exist, when compared with asylums of later date. On the compiler of this account pointing out some of these defects to Dr. Ferguson (one of the Commissioners for building the lunatic asylum at Kingston, Jamaica), that gentleman emphatically replied to the effect, that the asylum might have its defects; he had, however, seen most of the asylums in France, Germany, and the United States, as well as those in England; and he must say, with regard to the provisions, bedding, clothing, convenience, and comfort of the inmates, he had seen no other place of the kind to equal it; and it may be added, that visitors generally express similar opinions.

Table No. I.

Return of Patients annually admitted into the Asylum since its opening, 16th May, 1831, to 31st Dec. 1849, showing also the number of discharges and deaths during the same period.

Admitted.				Discharged.						Died.			Remaining in Asylum 31st Dec. 1849.		
				Cured.			Relieved.								
Year ending Dec. 31st.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.
1831	136	159	295	34	30	64	2	3	5	75	88	163	25	38	63
1832	188	234	422	35	54	89	10	12	22	112	116	228	31	52	83
1833	90	113	203	26	32	58	4	2	6	43	55	98	17	24	41
1834	70	52	122	17	17	34	5	3	8	40	25	65	8	7	15
1835	78	63	141	15	20	35	5	2	7	45	25	70	13	16	29
1836	67	46	113	19	15	34	2	..	2	31	14	45	15	17	32
1837	36	27	63	9	6	15	6	..	6	15	11	26	6	10	16
1838	139	186	325	37	33	70	8	5	13	56	60	116	58	83	126
1839	123	95	218	39	24	63	4	5	9	58	31	89	22	35	57
1840	100	51	151	24	13	37	7	..	7	49	19	68	20	19	39
1841	102	122	224	26	33	59	5	7	12	47	34	81	24	48	72
1842	92	91	183	25	24	49	5	6	11	39	26	65	23	35	58
1843	74	86	160	22	23	45	12	8	20	22	24	46	18	31	49
1844	61	57	118	9	13	22	6	6	12	21	14	35	25	24	49
1845	56	48	104	10	12	22	2	7	9	26	9	35	18	20	38
1846	59	36	95	15	14	29	4	3	7	27	5	32	13	14	27
1847	56	44	100	13	18	31	6	..	6	22	4	26	15	22	37
1848	64	41	105	15	13	28	7	1	8	12	7	19	30	20	50
1849	67	46	113	10	7	17	1	..	1	8	5	13	48	34	82
	1658	1597	3255	400	401	801	101	70	171	748	572	1320	409	554	963

The number of patients daily employed is about 190 males, and 310 females.

Table II.—The Establishment, December, 1850.

Officers.—1 Visiting physician; 1 resident medical officer (males); 1 resident medical officer (females); 1 dispenser; 1 chaplain; 1 clerk to committee of visitors; 1 clerk of the asylum; 2 assistant clerks; 1 store-keeper; 1 assistant store-keeper; 1 engineer; 1 schoolmaster; 1 matron; 1 assistant matron; 1 housekeeper; 1 superintendent of bazaar; 1 superintendent of workroom; 1 superintendent of laundry.

Servants, Males.—26 attendants; 2 garden attendants; 2 tailors; 2 upholsterers; 2 shoemakers; 1 tinman; 1 brewer; 4 stokers; 1 gas-maker and chimney sweeper; 1 gardener; 1 cowman and pigman; 1 assistant to cowman and pigman; 1 carter; 3 farm and garden labourers; 1 porter at lodge; 1 house porter; 1 house labourer; 2 foul-linen washers.

Servants, Females.—1 head attendant; 37 attendants; 4 housemaids; 1 bakeress; 5 laundry maids; 2 laundry maids (foul linen); 2 cooks; 2 kitchen maids; 1 dairy maid.

The expenditure of the asylum for the year 1849 was 22,061*l.* 2*s.* 4*d.* for the maintenance, &c., of the patients; and 1808*l.* 11*s.* 4*d.* for the repairs and improvements of the asylum, making together a total of 23,869*l.* 13*s.* 8*d.*

For the information of those persons desirous of visiting the asylum, it may here be mentioned that orders for admission can be obtained of any member of the Committee of Visitors.

In order to conform to the Act of Parliament already cited (8 & 9 Vict. c. 126), it became necessary, in 1847, to provide an additional pauper lunatic asylum for the county of Middlesex. Architects were invited to compete for the design of the building. Thirty-nine competitors sent in plans accordingly, and from these the county magistrates selected three as deserving of reward. The architects thus signalized, were, for the first prize, of 300*l.*, Mr. Daukes; for the second prize, of 200*l.*, Messrs. Harris and Godwin; and for the third, of 100*l.*, Messrs. Allom and Crosse. The design submitted by Mr. Daukes has been accordingly adopted, and the building, of which the erection was commenced in the spring of 1849, is now completed. Before describing it, however, it will be interesting to notice the instructions issued by the magistrates upon the occasion of inviting the preparation of designs.

The land for the building is situate at Bet's Stile, near Colney Hatch, between Finchley Common and Southgate, and consists of 119 acres, lying on both sides of the Great Northern Railway, and having a gradual and general slope towards the south-east. The accommodation to be provided is for 1000 patients, of both sexes, in separate departments for the several classes of patients, and in separate buildings for the two sexes, either wholly unattached, or connected only by the chapel and offices common to both. The accommodation for the female patients to be one-third greater than for males. Besides the asylum, airing-grounds, &c., the following buildings and offices to be provided. A chapel for 400 persons; apartments for two resident medical officers, one for each sex; apartments for a resident superintendent, and for a resident matron; a committee-room, and rooms for the reception and examination of patients of each sex on admission, and for visitors to patients of each sex; a surgery and infirmaries, baths, and all domestic offices, as storehouses, brewhouse, bakehouse, laundries, workshops, and farm buildings; also, at the entrance, a porter's lodge, with accommodation for a man and his wife, on one side, and clerks' offices on the other side of the gateway. Provision to be also made for manufacturing gas within the premises, and for employing it in the general lighting of the establishment. Suggestions were also officially made upon the following several points:—

Form and Site for the Building.—The form to be such as to afford an uninterrupted view of the country, and the free access of air and sun. The several galleries and wards to be so arranged that the medical officers and others may pass through all of them without retracing their steps. The site of the building to be selected with the inclinations of surface such that the day rooms, corridors, and airing courts have a southern or south-eastern aspect. Those portions of the asylum to be occupied by patients, to have not more than two storeys—that is, ground and first floors.

Arrangements for Classes, Attendants, separate Rooms, &c.—For each class, besides the exercise galleries, a room should be provided with an open fire-place, easily accessible from the kitchen, and equal in dimensions to about ten superficial feet for each patient to be received therein. The attendants upon each class are also to have separate rooms placed so that they shall be in close proximity with the dormitories and the closets containing stores, &c. The separate sleeping-rooms to be 9 feet by 6 feet 6 inches, and from 11 feet to 12 feet 6 inches in height; and the dormitories should contain 48 feet superficial, and about 576 cubical feet for each patient. The several galleries, day rooms, dormitories, and cells should be distinguished by numbers, and the portions of the building assigned to the several classes of patients, by letters. The staircases should be without winders, or long straight flights, and the wells built up. Three distinct classes are to be provided for among the patients of each sex. Of the sleeping accommodation, one-third should be provided in separate rooms, and the remainder in dormitories, each containing from three to twelve beds. The aged, dirty, infirm, and epileptic patients to be accommodated on the ground-floor, and the violent and noisy patients removed as far as possible from the other patients. The staircases to be of stone, and the building, as far as possible, of fire-proof construction.

Warming, Ventilating, and Supply of Water.—Complete arrangements should be made for warming and ventilating the whole of the building, and for supplying hot water. Descending or horizontal smoke flues, if used, to be constructed entirely of brickwork, rendered or pargeted inside and out; and if flues from any of the furnaces are carried up through any of the main walls, they should be constructed with a hollow space round them, to prevent the transmission of undue heat in warm seasons, and allow a moderation of the temperature of the building whenever desired. The supply of water to be equal in quantity to 40 gallons per day for each patient, and should, if possible, be obtained at such a level that it may reach the highest parts of the building, without forcing.

The asylum recently erected at Colney Hatch, from Mr. Daukes' design, is in the Italian style of architecture, with stone groins and dressings, and has an extreme length of 1881 feet 8 inches, and depth of 670 feet 6 inches. The total number of rooms, including the common offices, chapel, infirmaries, &c., is 937. The corridors, centre colonnade, &c., are paved with the patent metallic lava of Messrs. Orsi and Armani; and the terraces, flats, &c., are roofed with the same material, which is said to be perfectly impervious to moisture. An Artesian well, 350 feet in depth, has been sunk for the supply of water. Among the principal apartments is one 112 feet long, and 58 feet 6 inches wide, fitted with an orchestra, for balls, concerts, &c., for the amusement of the unfortunate occupants of the asylum. The board room is 30 feet by 20 feet, and has the walls covered with modern Venetian stucco, coloured and polished to represent borders of Carrara marble, and panels of Scienna.

MARKETS.

The markets of the metropolis are not what a stranger would expect to find when he visits so large and wealthy a city. Some of them are, by their ill construction, ill ventilation, ill location, and total want of sanitary regulations, disgraceful to a civilized nation; and there are not wanting persons—even in respectable positions in society—to defend and uphold those nuisances which have incontestably been proved to be injurious and demonstrably fatal to society. The corporation of the city of London have not shown that alacrity which might naturally have been expected of enlightened men. It may be well for those who live in suburban villas and country mansions to deprecate comforts and health for those who, toiling all the day, have been less fortunate in the commercial world than themselves; however, the necessity of legislative interference is now insisted upon, that the abomination complained of should be expelled from the heart of this great and populous metropolis.

Billingsgate Fish Market is in Lower Thames Street, adjoining the western side of the Custom House; it has its own port for the landing and sale of all kinds of fish on a most extensive scale. Fish from all parts of the coast and from foreign ports are here sold. The lobster from Norway is a most valuable article of import; a very large sum annually is remitted by the salesmen for this fish alone. This market is under strict, yet judicious management by city authority, and all tainted fish unfit for human food is destroyed, and the vendor fined for his attempt at imposition. This market is an exception to the foregoing remarks; it has lately been much improved by the city architect, Mr. Bunning, who has attended strictly to its ventilation, drainage, and sanitary regulation. This object is effected by mechanical means. Mr. Bessemer, the engineer, has constructed a centrifugal machine for exhausting the air: it consists of two discs of iron, each eight feet in diameter, and having a central opening of half that size, and placed on a shaft, 2 ft. apart from each other, and attached by eight radial partitions, forming a series of segmental chambers around the axis; a communication is established between the central openings of this disc and the place to be exhausted, by several underground channels branching off to different points, where openings are formed for the inlet of the air, while the external diameter of the discs communicate with an air shaft leading upwards above the roof of the building, where the foul air is dispersed. When a rapid rotary motion is communicated to the disc the air contained in its segmental chambers immediately acquires centrifugal force, and escapes at the outer edge of the disc, while new portions of air rush to the centre of it, from all the numerous inlets before referred to, and thus fill up the vacuum formed by the escape of it at the periphery; so that a continuous and powerful action is kept up, carrying out of the market at least 50,000 cubic feet of foul air per minute, the space previously occupied by which is immediately reoccupied with fresh air from the open front next the river.

Upon this same centrifugal principle Mr. Bessemer has recently patented a pump of the most powerful description, for lifting and forcing water, which is here applied for the supply of water for washing the market; and filtered water for cleaning the fish, and the general use of the market people, is also supplied by means of this small though powerful pumping machine. Two tons of water per minute are lifted 35 ft. high from filters in the bed of the Thames, and from thence delivered into a fountain in the upper market; 1¾ ton per minute of unfiltered water is lifted from the Thames, and passes in a constantly-flowing stream along a series of gutters formed at short intervals along the whole surface of the market, and covered over with gratings, so that the drainage from the numerous fish-stalls, uniting with the water flowing in these gutters, is immediately carried off, while 1 ton per minute of water is in like manner distributed throughout the lower market, from which it is again pumped out by the same apparatus, and discharged into the Thames.

The quantity of water raised, it is said, by this small pump, is 77,000 imperial gallons per hour; and at the price charged by the water companies, would exceed 4000*l.* per annum. Notwithstanding there are four different elevations to which the water has to be raised in such vast quantities, and that some part of it is filtered, some in the state of ordinary Thames water, and the other part consisting of the foul drainage water from the lower market, one apparatus deals with these different masses of water without any intermixture; and the entire apparatus consists only of *one single revolving piece*, having *no rubbing surfaces*, and fitting closely *nowhere* except at its *axis*, and is contained in a cast-iron case, and without any reciprocating parts whatever, not even the alternating motion of a valve; nay more, the same axis on which the centrifugal water discs are fixed, serves also for the axis of the large air disc used for ventilation; and thus by the simple rotation of one revolving piece all the effects before referred to are produced, motive power being applied from a very simply-constructed oscillating steam engine of 16-horse power, the fly-wheel of which is made broad enough to carry a gutta-percha strap, passing over a drum in the centrifugal pump shaft, and thus communicating a sufficiently rapid motion.

Bloomsbury Market, in Bury Place, Bloomsbury, is for the sale of provisions generally, but of very small extent.

Borough Market, Southwark, is for the sale extensively of provisions generally, particularly of potatoes. The best potatoes in the south part of the island are grown in Kent, and have a lucrative sale in this market.

Borough Market, Southwark, is for the sale of hops, the greatest part of which are the growth of the counties of Kent, Sussex, and Surrey.

Brooke's Market, in Brooke Street, Holborn, a very small market for the sale of provisions generally.

Covent Garden Market, opposite St. Paul's Church, Covent Garden, is within an extensive square piece of ground, and of great antiquity. The eastern and northern angles of the margin of this market are Piazza and capacious mansions above erected by Inigo Jones, architect to Charles I. and II. This market is the property of the Duke of Bedford, and yields a large annual revenue after payment of contingent expenses. The late Francis, Duke of Bedford, in 1830, reconstructed and built the present market from the design and under the superintendence of Mr. Wm. Fowler, architect, at a cost of 50,000*l*. It consists of three sides of a quadrangle, with a Doric colonnade around it, supported by granite columns, and is undoubtedly a finely-conceived design, and a credit to the metropolis. Its arrangement is admirable, in such divisions as are suitable to the salesman, the purchaser, and the visitor. The productions of the hot-house, and of the growth of those who spare no expense in producing the finest fruit in all seasons of the year, and flowers, herbs, and vegetables of the best kinds, are here exhibited for sale. The promenade in the avenue, in which the best fruit shops are situated, is desirable and gratifying to the visitor; above the entrance on the eastern extremity are galleries for the sale of plants and flowers of a superior description.

Carnaby Market, near to Broad Street, Golden Square, is now but a small provision market.

Corn Market, Mark Lane, is an elegant structure, the front being of the Greek style; in the interior are suitable offices for business, the hall also having those divisions and stands necessary for the purposes of showing the different kinds of grain and seeds, and effecting the sale of the same. The sales of wheat in this market have a considerable influence on the prices in the provinces, as well as regulating the demand and import of the foreign merchant.

Clare Market, in the parish of St. Clement's Danes, approximate to the south-west corner of Lincoln's Inn Fields, is for the sale principally of butchers' meat, also for the sale of vegetables, tripe, dogs and cats' meat. Clare Market, although smaller than others, is not less a nuisance. There are about twenty-six butchers in and about it, who slaughter from 350 to 400 sheep weekly in the market, or in the stalls behind, and in cellars. There is one place only in which bullocks are slaughtered. The number killed is from fifty to sixty weekly, but considerably more in winter, amounting occasionally to 200. The number of calves is uncertain.

Cumberland Market, York, or Clarence Street, on the east side of Regent's Park, is for the sale of hay, straw, and other articles.

Farringdon Market, adjacent and on the west side of Farringdon Street, City (late the Fleet Market), erected on this site about thirty years since, occupies 1½ acre of ground. The structure is indifferently applicable, although the situation is most desirable, particularly for drainage, being on a slope. It is for the sale of vegetables, butchers' meat, fruit, &c.

Finsbury Market, near Finsbury Square and City Road, is for the sale of provisions; now little in use.

Fitzroy Market, a small one at the northern end of John Street, Tottenham Court Road, is for the sale of butchers' meat and vegetables.

Greenwich Market, Greenwich, is for the sale of provisions generally.

Honey Lane Market, on the north side of Cheapside, is for the sale of provisions; almost extinct, by being built upon for the purpose of founding a city school.

Hungerford Market, in the Strand, near to Charing Cross, is for the sale of fish extensively, fruit, vegetables, and butchers' meat. The design and construction of this market is by Mr. Wm. Fowler, it is of the Italian character, and cheerful and interesting on the water-side exterior. Covent Garden is by the same architect. The upper part of the market consists of three avenues, with shops on each side; the whole roofed in. It has now become a market in which much business is done, and of great convenience to the west-end residents; it is the thoroughfare to the Suspension Bridge, across the Thames.

Hoxton Market, Hoxton Town, north-east of the City of London, is for the sale of provisions generally.

Hutchinson Market, Houndsditch, is a market for general provisions, but in little use; intended for the Jews in this quarter.

Islington Market, was intended to be upon a most convenient and extensive scale, to relieve that of Smithfield, for the sale of cattle of all kinds. An immense amount of money has been expended by a Mr. Perkins, but his praiseworthy object was defeated by the influence and intrigue of the city of London, and is for the present used as a laystall.

Leadenhall Market, the first turning on the right, east from Cornhill, is for the sale of poultry, dead and alive, also for the sale of the hides and horns of cattle; calves and pigs only are here slaughtered; upon an average there are thirty-five to forty salesmen, who kill upon an average from 300 to 400 sheep per week, and occasionally some of them slaughter as many as 300 to 400 sheep each per week.

Leather Market, Bermondsey, on the Southwark side of the Thames, is an important market for the sale of leather.

Lumber Court, Seven Dials, is for the sale principally of fish, and also for vegetables and butchers' meat.

Mortimer Market, a very obscure market in Tottenham Court Road, is for the sale of provisions, and is a convenience for the neighbourhood.

Newgate Market, abutting on the south of Newgate Street, is most extensive for the sale of carcase and retail butchers' meat; adjacently is Tyler's Market, of a similar description; Newgate Market, so important for the extent of its business, is yet one of the nuisances in the city of London. The slaughterhouses for sheep are almost exclusively in cellars underneath the shop where the pieces or joints are sold in retail. The access to these cellars is by steps, over which a board is occasionally placed, to act as an inclined plane, for the animal to slide down; more frequently a much more summary process is had recourse to, the animal is seized by the butcher, and pitched headlong into the cellar by main force, where, unable to rise from broken limbs, or other injuries sustained by the fall, they lie awaiting their turn to be slaughtered. In this market poultry is also sold.

New Exchange, Clothes Market, in Hounsditch, is for the sale and barter of all kinds of goods, particularly old clothes bought by the Jew crier in his purchases made daily in the various streets of London.

Newport Market, Great Newport Street, west of Long Acre, is for the sale principally of butchers' meat. In this market and its neighbourhood there are from forty to fifty butchers, together with slaughtermen and drovers. They kill upon an average from 300 to 400 bullocks weekly, from 500 to 700 sheep, according to circumstances, and from 50 to 100 calves; the number of the latter varies very much; 1000 to 1100 sheep have been known to be killed in one week, and many more bullocks than at the present time. As many are killed in the country, and are brought in by the railways.

Old Clothes and General Market, Houndsditch, is for the sale and barter of all kinds of goods, particularly old clothes. It is a Jews' market.

Oxford Market, on the north side of Oxford Street, near John Street, Portland Street, is a small market for the sale of vegetables and butchers' meat.

Orange Market, Duke's Place, Houndsditch, is an extensive market for the sale of oranges; large fortunes have been made in this market.

Portman Market, Marylebone, near Paddington, is for the sale of hay and straw, also for butter, poultry, butchers' meat, and other provisions.

Rag Fair, and Old and Second-hand Clothes Market, Petticoat Lane, now called Middlesex Street, Minories, is for the sale of the refuse of the metropolis.

Smithfield Market, the great area, the great mart of business for its purpose, and the great nuisance of the metropolis. It is situated near what may be called the heart of the city of London; it is bounded on the north by St. John Street, on the south by Giltspur Street, on the east by Long Lane, and the west by Cow Lane; these are leading streets in and out of this market. In this market the most lucrative and the largest business is transacted for the sale of all kinds of cattle, milch cows, pigs, horses, mules, asses, dogs, and goats in the world; hay and straw, &c., are also sold largely.

The salesmen of Smithfield market, of whom there are about 160, may be described as commission agents, to whom the farmers and others who fatten cattle consign their stock, of which they now transmit some portion by railway. They receive from 2*s.* 6*d.* to 4*s.* per head for the sale of oxen and cows; from 10*s.* to 15*s.* per score for sheep and lambs; and 1*s.* per head for calves. In Smithfield there are seven bankers, who are either salesmen or butchers, and are generally connected with those trades. The principal supply of live cattle for the consumption of the metropolis is from the northern counties. Smithfield is not only the chief market for the supply of the inhabitants of the metropolis, but is a market of transit for the southern counties—the transactions amounting to the enormous extent of 7,000,000*l.* sterling, annually. In 1846, there were sold of beasts, 226,132; sheep and lambs, 1,593,270; calves, 26,356; pigs, 33,531. There are many slaughter-houses in the neighbourhood of this market, as well as in the surrounding neighbourhood, all of which are much complained of.

Spitalfields Market, to the right of Bishopsgate Street and Norton Folgate, is a large market for vegetables, particularly for potatoes, and for poultry, butchers' meat, and fruit.

St. George's Market, on the left of the upper end of Oxford Street, is for the sale of butchers' meat; there are in its vicinity numerous stalls for vegetables.

Shepherd's Market, May Fair, south side of Curzon Street, is for the sale of provisions generally, is a convenience for this genteel neighbourhood, and is not a nuisance.

Whitechapel Market, east of Aldgate, City, is an extensive market for the sale of butchers' meat, and for the sale of the Jews' killed butchers' meat; carcase butchers deal here to some extent. Many slaughter-houses here and in Aldgate are at the backs of the houses, to which there is no access but through the front shop. The animals, however infuriated, have to be forced, usually by the tail-twisting process, into these huddled-up slaughter-houses. There is a large market carried on in the road of hay, straw, &c.

There are many public streets, especially in crowded neighbourhoods, where open public highway stalls exist, permitted by the parish authorities, and by the police, for the accommodation of a large and poor population, but they are under strict regulation to keep the peace, and not to offer obstruction to the foot passengers.

There are also extensive markets or fairs in the neighbourhood of the metropolis, for the sale of all descriptions of cattle, milch cows, pigs, horses, mules, asses, dogs, goats, hay, straw, and grain of all kinds; at Croydon, in Surrey; Romford, in Essex; and Southall and Uxbridge, in Middlesex, &c., &c., &c.

Thus there are in the metropolis thirty-six markets, some of which are designed with taste, others more the effect of accident in their arrangement. Those for the sale and slaying of cattle ought, for the health and safety of the immediate residents, to be removed out of London

MERCANTILE MARINE.

London is one of the greatest shipping ports in the world, and to her belong many ships and seamen. For ship-building and steamboat-building, London, likewise, holds the foremost rank. The government has its yards for these purposes, at Woolwich and Deptford; but many of the private docks and ship-yards are very large. These are seated along the banks of the Lower Thames; but some of the most celebrated are Messrs. Wigram's, Green's, Young's, near Blackwall (see article "Docks"). On the Thames are built vessels from frigates, war-steamers, and Indiamen, down to yachts and wherry-boats. A considerable business is done in building ships and steamers for the home trade and for foreign governments, and likewise in repairing. Many large class ships and steamers are built. The manufacture of marine engines is carried on by distinct firms, who have establishments seated near the Upper and Lower Thames. Iron ships are likewise built (see article "Mechanical Engineers"). Ship-launches are celebrated as festivals in the riverside districts, and strangers have very little difficulty in getting admission to the sight. On a ship being built it is registered in the General Registration Office at the Custom House, and likewise in Lloyd's Register, as already described. The former registry constitutes a national and legal title, the latter is the valuation on which it is insured against sea risks. Besides the ships registered in London, the London merchants are owners and sharers in ships in all parts of the world. Business relating to shipping is chiefly transacted at Lloyd's Rooms. Under the head of "statistics" the extent of the shipping of London is shown.

The seamen are registered as well as the ships, for which purpose government offices are established in London. Every seaman must have a registration ticket, and is entitled to the protection of the authorities in consideration of it. Causes relating to seamen's wages are decided at the Thames Police Office, but criminal cases, arising on the high sea, come under the jurisdiction of the Central Criminal Court, as holding Admiralty Sessions. To supply masters of ships with seamen, offices are opened under shipping-masters, whose duty it is to assist in carrying out the agreements between masters and men, and with apprentices. On returning home the sailors can require the assistance of the shipping-master in receiving their wages. Sailors' homes are in progress for receiving seamen when in port. At present these establishments are supported by private subscriptions. Each seaman in employment is charged with a small contribution towards the Merchant Seaman's Fund of the port, for pensioning aged seamen and their widows. The relief given is, however, small, and the funds hitherto have not been well managed, Lads are taken as apprentices to the sea-service; and the London merchants, under the name of the Marine Society, maintain, by subscription, a ship as a school on the Thames, in which lads are trained for the sea.

Formerly a master or mate of a merchantman was not required to undergo any examination, but now the Local Marine Board, chosen partly by the ship-owners of London, and partly named by the Board of Trade, have power to appoint officers to examine all new masters and mates as to general education and knowledge of seamanship. The candidates are arranged in classes for master or mate, according to proficiency, and the certificate given may be forfeited for incompetency, habitual drunkenness, or tyrannical habits.

The following are the chief points worthy of examination by a stranger—Greenwich Hospital; the Dreadnought, Hospital Ship; the Sailors' Homes; the Seamen's Floating or Ship Church; the Seamen's Land Church; the Marine Society's Ship; the Greenwich Hospital School; Christ's Hospital Mathematical School; the Royal Naval School; the Trinity House of the Corporation for managing the lighthouses; the collection of models in the Navy Department, Somerset House; and the United Service Institution—the charts of the hydrographical department being the finest collection of surveys in the world; the Royal Observatory, Greenwich; the Nautical Almanack Establishment; Woolwich and Deptford Dockyards; and Woolwich Marine Engine Factory; the private Dockyards, and Marine Engine Factories; the factories for rope-making, anchor and chain-cable making, sail-making, and patent process for preserving canvas. The Docks belonging to the several companies. Line-of-battle ships (the Dreadnought), frigates, and war-steamers (Woolwich); Indiamen (Blackwall); colliers (Pool); lightships (Blackwall); Scotch steamers, screw-ships, Goole sloops, ballast-lighters and steam-dredgers; Lord Mayor's and city barges; fishing-smacks (Barking); sea and river yachts, tug-boats, halfpenny steamers, canal boats, lighters, six-oared cutters, barges, wherries, and wager-boats (Lambeth); fishing-punts (Putney). Besides English craft, a great variety of foreign craft are to be seen.

MILITARY APPOINTMENTS.

No nation in Europe has under command so small an army as the nation which holds sovereign power over upwards of 150 millions of subjects; her colonies in every clime, still extending her territory by the introduction of arts, commerce, education, and religion. It is an astounding fact, that the small but brave army of this nation is under such excellent management, and is characterised by such efficiency for the public service, that by its prowess it has swept every field where her banner has been unfurled. It is a great moral lesson to those nations on the continent who are fond of showing their power, and spending their millions at the playing of soldiers.

The British army, including all arms, does not exceed 100,000 men. The native army of India paid by the East India Company is, in round numbers, 100,000 men, chiefly officered by Englishmen. The British army is recruited in England, Wales, Scotland, and Ireland. The whole army is well trained, and most effective, composed of the youth and sinew of the empire, ever ready, faithful, and true to its colours.

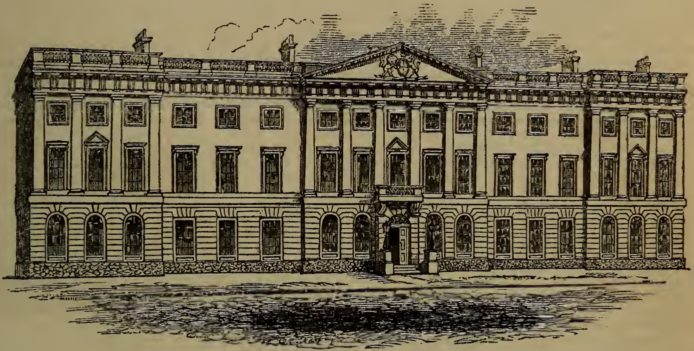
Field Marshal Commander-in-Chief—The Duke of Wellington.
Private Secretary—A. Greville, Esq.
Military Secretary—Lieutenant-General Lord Fitzroy Somerset.
Secretary at War—Right Honourable Fox Maule.
Deputy do.—Laurence Sullivan, Esq.

All military business is transacted, all appointments are made and confirmed at the Horse Guards, Whitehall, excepting the Ordnance, which is conducted at the Ordnance Office, under the Marquess of Anglesea, who is at the head of this service. (See article "Royal Engineers.")

The Adjutant-General's Office is at the Horse Guards.
Adjutant-General—Major-General G. Brown.
Deputy Adjutant-General—Colonel G. A. Wetherall.
Assistant Adjutant-General—Lieutenant-Colonel William Sullivan.
Deputy-Assistant Adjutant-General—Captain A. J. Pack.
Recruiting Department—16, Duke Street, Westminster.
Military Superintendent—Colonel Sir Richard Doherty.
Quarter-Master-General's Office—Horse Guards.
Quarter-Master-General—Colonel James Freeth.
Paymaster-General's Office—Whitehall.
Paymaster-General—Earl Granville.
Judge-Advocate-General's Office—35, Great George Street, Westminster.
Judge-Marshal and Advocate-General—Right Hon. Sir David Dundas.
Army Medical Board Office—St. James's Place.
Director-General—Sir James M'Grigor.

THE MINT.

The Royal Mint is an extensive government edifice, in which the coinage of the realm is managed. Here bullion is assayed, and manufactured into specie, or money, for interchange in commerce, and in all adjustments of traffic between man and man. The building is of the united skill of Mr. Johnson and Sir Robert Smirke. It is a large and somewhat neat edifice, appropriately constructed, with suitable and extensive establishments for its purpose. It is arranged in three stories, having a centre, as seen in the annexed engraving, decorated with a pediment and columns with wings.



THE MINT.

The Royal Mint attained its constitution of superior officers in the eighteenth year of the reign of Edward II., and with very few alterations continued as then established till the year 1815. Within these two or three years very important alterations and improvements have been made in its internal economy and management.

It may not be uninteresting to know that by an abstract account of the coinage which the Bank of England paid for gold and silver bullion in each year, from 1697 to 1811, it appears that as early as 1710 they paid 4*l.* per ounce for standard gold, and 5*s.* 3*d.* for standard silver; and it is probable that the same price existed at a more early date after the re-coinage, though the accounts state no price before 1710. This account is conceived to be of very great importance. It will satisfactorily explain why Mr. Locke's theory did not permanently produce the effect which the legislature expected from it. By a reference to the prices paid for gold by the Bank of England from 1710 to 1717, it appears that the average price per ounce was 3*l.* 19*s.* 11*d.* during this period; the guinea was current for 1*l.* 1*s.* 6*d.*, at which rate the ounce of gold was coined into 3*l.* 19*s.* 8¾*d.*, for if one guinea, or 5 dwts. $9\frac{29}{89}$ gr. be worth 1*l.* 1*s.* 6*d.*, 480 grains, or an ounce, will be worth 3*l.* 19*s.* 8¾*d.* It would appear, then, that the market price of gold was only 2¼*d.* above its Mint price; and some debasement by wear may have existed upon the gold currency at this period, causing such excess of the Mint price.

While the Mint, therefore, coined gold at the rate of 3*l.* 19*s.* 8¾*d.* per ounce, and silver at 5*s.* 3*d.*, the relative proportion was as 15·43 to 1. There is only one quotation of silver given for the period in question, and it is 5*s.* 3*d.* per ounce. If this average is taken for the seven years in question (and we may be justified in doing so by the market prices which follow in 1718 and subsequent years, as extracted from Castaign's papers, laid before the House of Commons, and ordered to be printed, March 4, 1811), at 5*s.* 3*d.* per ounce, the average proportion of gold and silver in the market would be 15·22 to 1; but no individual would carry 15·22 ounces of silver to the Mint to be coined into about 3*l.* 18*s.* 7*d.*, when these 15·22 of silver would procure an ounce of standard gold in the market, which would be coined into 3*l.* 19*s.* 8¾*d.*, making thereby a profit of about 1*l.* 7*s.* 6*d.* per cent. While this profit continued, it may reasonably be inferred that gold, and not silver, would be the standard of our money.

It was in September, 1717, that Sir Isaac Newton delivered his report to the Lords of the Treasury, giving it as his opinion that gold was considerably overrated in the Mint, with respect to silver; and, in consequence of this report, the guinea was, by proclamation, dated 22 December, 1717, declared current at 1*l.* 1*s.* It is of importance to observe the effect produced upon the price of gold by this proclamation, proving that the silver currency had not operated as the standard of value during the period in question. When the guinea became a legal tender, at 1*l.* 1*s.*, the price of gold then became fixed at 3*l.* 17*s.* 10½*d.* per ounce at the Mint.

In March, 1815, a new constitution was introduced, founded upon a very valuable report drawn up and presented to this committee by the Right Hon. Wellesley Pole, who had been appointed Master of the Mint in the preceding year.

It is the duty of the deputy-master and worker to receive, on account of the master and worker, her Majesty's own bullion of gold and silver, as well as the bullion of any other person, brought to the Mint for coinage; to give acknowledgment for the same, specifying the number of ingots, or parcels of coin, according to the purport of any invoice or bill delivered therewith; to see the ingots safely deposited in the care and joint custody of himself and the master assayer, for the purpose of being assayed, previous to their importation into the office of receipt; to cause the ingots, when duly assayed, to be brought into the office of receipt, without delay, there to be weighed in the presence of the importers and cheque officers; to make out a Mint bill, to be delivered to the importer, testifying the weight, fineness, and value of the several ingots, &c., together with the day and order of the delivery into the Mint, and to sign a receipt annexed to the said bill, witnessed by the comptroller and Queen's clerk; to give directions to the master's first clerk, for the combining or potting the ingots for the melting, with the proper portion of the alloy; to see that the same be duly entered by the said first clerk and melter, in the pot book, and the said book examined by the comptroller and Queen's clerk; and to deliver out of the stronghold such ingots and bullion as are potted, and charge the melter therewith according to the standard weight of each pot; to keep an account of the bars received from the melting-house, and delivered to the moneyers, and also of the scissel returned by the moneyers to the melter, for which their respective receipts will be given, and entered in the pot book, that they may be charged therewith; to receive the coined monies from the moneyers, after the same have been duly tried at the pix by the Queen's assayer, comptroller, and Queen's clerk; and to deliver the same to the importer, receiving back at the same time the Mint bill which had been given: or if the same be not cleared off, to require that such portion thereof as has been delivered be indorsed on the bill by the parties, by a receipt, till the whole be discharged; to seal and lock up in the usual chest, in conjunction with the King's assayer and comptroller, the pieces reserved for the public trial of the pix, and to make good to the parties the pieces so taken, by payment in their sterling value, charging the same to the public expense. As the first executive officer of the Mint, to watch over every branch of the department; to inspect and oversee, as much as lies in his power, the meltings, assayings, and all the different processes of the coinage, and to report to the master on the conduct of the officers; to draw and indite all letters, instructions, commissions, and other writings agreed upon and ordered by the master and worker for the service of the office, and to have the same recorded by the clerk of the papers; to receive all monies issued at the Exchequer or elsewhere, for the service of the Mint; and to keep the public account of the master, to be laid annually before the auditors of public accounts, with the proper vouchers; the said account to be signed and attested by the master himself. There are also stringent regulations of the Queen's assayer and the other officials, which our space will not allow us to add to those of the deputy-master and worker.

The gold is melted in pots made of black lead; those now used in the Royal Mint are of superior manufacture, and less liable to break in annealing than those previously used. The process of melting silver now practised is a recent invention, and a very great improvement. A further and a more excellent account of the whole process of coinage, with a perfect description of the machinery, will be found in the seventh edition of the "Encyclopædia Britannica."

Of the machinery much may be said; it is of curious and very ingenious invention, various processes being carried on by a series of machines, in the rooms called the rolling room, the cutting-out room, the milling room, the analyzing room, the ironing, press room, &c. That of the drawing bench is most ingenious, by which the metal, when tested to show that it contains the proper alloy, is drawn through rollers to the precise thickness required for the rim which is to be cut out of it. The difference of a hair's breadth of gold in any part of the plate or sheet of gold would alter the value of a sovereign. Among other machines, the circular disc may be particularized. The cutting-out machine was invented by Messrs. Boulton and Watt, in 1790, who prepared it at that time for working the coining or striking presses, and for improving the same by a better method of working smaller presses for cutting out the blanks. Other machines for casting the ingots of silver, laminating rollers, rolling wheel work, turning, striking press, &c., &c., &c., are the works of Messrs. Boulton and Watt, Messrs. Maudslay and Co., and Messrs. Sir John Rennie and George Rennie.

Regulations for the Admission of Visitors to the Royal Mint.

I. Applications for permission to view the Royal Mint are to be addressed to the master or deputy master, in writing, describing the name and abode of the applicant, and the number of his party, not exceeding six in all.

II. The master or deputy master (unless he shall sign a "master's order" in favour of the party) will transmit the application to the moneyers, and acquaint the party, by a printed form, that his application has been sent to the Royal Mint for consideration.

III. Upon the receipt of the application, the moneyers will forthwith take it into consideration, and will exercise their discretion as to the issue of an order of admission; requiring, in general, either:—1. That the applicant should be known to them personally or by character; or 2, that he should be recommended by some of the officers of the Mint, or by some other party so known to them; or 3, that he should be recommended, if a foreigner, by the diplomatic or consular agent of his nation.

IV. Upon being thus satisfied, one of the senior moneyers will countersign and send to the applicant a printed form of admission bearing the heading "General Order," and stating the number of the party to be admitted. When the application is not granted, a printed copy of Rule No. III. shall be sent to the party.

V. The "General Orders" will bear the printed signature of the master, and will be regularly numbered, and delivered by the deputy master from time to time, only to the company of moneyers, to be issued by them.

VI. The master or deputy master will also, at their discretion, sign orders of admission, inserting at the same time the name of the party to be admitted, on a separate form, to be entitled "Master's Order," in favour of any particular person, with or without a party of any given number, not exceeding six; but only in favour of persons known to them, and for whom they will consider themselves responsible. The master will transmit every such order signed by him to the deputy master (in a printed envelope, marked "Admission Card"), who will forward the same, as well as any similar orders signed by himself, to the moneyers, for the purpose of having a time of admission marked thereon. The moneyers, having so completed the orders, will transmit them without delay to the parties.

VII. The person presenting an order of either description, in the hall of the Mint Office, shall write his own name and address in a book, to be kept there for that purpose, and the names of all the persons accompanying him.

VIII. The order shall next be presented at the moneyers' office, where it shall be examined, and the moneyers will then direct a proper person to show the party round the works.

IX. The original order shall be returned to the Mint Office.

MUSIC, OPERA, ORATORIA, MUSICAL SOCIETIES, ETC.

London abounds in musical entertainments. Royalty and nobility have the Queen's Theatre; the gentry and wealthy have now the Royal Italian Opera; the lovers of sacred dramatic music have Exeter Hall and the Cathedrals; the more lively disposed of all ranks have the operatic melodrama, burlesque opera, &c. Concerts also are numerous and various—from the full orchestra to the quartette; from the classical to the ordinary—and at all charges, from the half-guinea ticket to a much lower price. To all and each of these the stranger will find easy admission. There are also numerous private societies, which admit none but the friends of members: some of these societies are convivial as well as musical, such as the Catch Club, the Glee Club, the Madrigal Societies, &c.; some charitable, as the Royal Society of Musicians, &c.; some consist of amateurs only, or professors only; others, of professors and amateurs. Of the principal of all these various musical societies, to which the polite and musical stranger may seek admission, and of which he may desire to know somewhat, we purpose here to give concisely the most interesting particulars.

THE QUEEN'S THEATRE, HAYMARKET.

This theatre was built in the year 1790, by an architect of the name of Novasielsky, in a very mean style. It has no proscenium, nor corridor. The colonnade and arcade are additional constructions, and were added to the original pile in the year 1818. The curtain of this theatre is 40 ft. wide; the depth between the curtain and the back of the pit is 84 ft., the greatest width of the pit being 60 ft.; the height from the pit floor is 51 ft.; the stage is 35 ft. in depth, and 80 ft. in width.

When it was first proposed to introduce into this country the performance of music set to a foreign language, there was considerable opposition to the proposition, and the idea was much ridiculed. In July, 1703, Italian interludes (intermezzi), consisting of music and dancing, were performed at York Buildings.

It was not until the year 1710 that an entire Italian opera was performed in this country. In this year the opera "Almahide" was brought out at this theatre, and the performers were exclusively foreigners; the words were wholly Italian. The Italian opera now gained a settlement, and has ever since remained the peculiar enjoyment of the English aristocracy, under whose patronage it has ever existed. In the year 1711 was performed Rolli's Opera of "Rinaldo" (from Tasso's "Gerusalemme Liberata"). Handel set the music to the words, and it was produced in the month of March.

About the year 1718, the English nobility projected the conversion of the Italian Opera into an Academy of Music, and subscribed, for this purpose, the sum of 50,000*l.*; the King (George the First), as patron, contributed 1000*l.* Handel, Bononcini, and Ariosti, were engaged as composers for the Academy. Handel was constituted manager, and engaged to write a certain number of operas. He went to Dresden and engaged singers, among whom was Senesino. The first opera produced for the Academy was "Radamisto," the music by Handel, and its success was unrivalled. But Bononcini, who had been sent for from Rome, and Ariosti, who came from Bologna, looked upon Handel, who was a Saxon, as an intruder; and a powerful faction, consisting of nobility and gentry, friends and partisans of Bononcini, was raised against him. The rage and insolence of the party caused the satire of the witty Dean Swift, and was put an end to by ridicule and a trial of skill between the three composers. The drama chosen for this purpose was "Musio Scevola," each party composing one act of the music. Handel was the conqueror, and, retaining the mastery, composed fifteen new operas for the Academy. But such was the effect of the opposition by the friends of his rivals, that he was compelled to retire from the management with the loss of 1000*l.*, besides having his constitution much impaired. Bononcini's operas, although his music was elegant and pleasing, are utterly forgotten; and Ariosti appears to have been a musician of no genius whatever.

It is not intended to give a history of the Italian Opera in London, but the principal events are interesting. It was not until the year 1817, that Mozart's grand and best work, "Don Giovanni," was performed in London, in a manner never surpassed, and it was so favorably received that it produced a net profit of 10,000*l.* His operas, "Cosi fan tutti," "Il flauto magico," "Clemenza di Tito," and "Nozze di Figaro," were beautifully performed, and most favourably received, for a long time, by the frequenters of the Italian Opera, until at length Rossini appeared, and the patrons, being desirous of novelty, were captivated by his light and playful compositions. The works of this composer, although vastly inferior to those of Mozart and his disciples, held possession of the taste of the opera fashionables for a long time, and the disciples and imitators of his school continue to supply the music for the Queen's Theatre.

The "Calypso," "Il ratti de Proserpina," and "Zaira," the three great works of Winter, were performed at this theatre under the direction of the composer. Billington and Grassini were the principal performers. Paisiello wrote the opera "La Locande," for this theatre. Rossini made his first appearance here in the year 1824; the singer, Sontag, in 1828; Rubini, in 1831; Jenny Lind, in 1847. Paganini's extraordinary performances took place here, for the first time, on the 3rd of June, 1831. The inimitable Malibran made her début here, in 1825. Catalini, in 1806. Pasta, in 1817. Lablache, in 1830. Persiani, in 1838.

The Queen's Theatre holds the first rank in the British metropolis, and it is here that we have first-rate performances of music and dancing, as well as first-rate audiences. The new combination of music with pantomime was first introduced here in the Ballet called "Orphèe," the music of which was composed by Winter.

THE ENGLISH OPERA.

The English Opera may be dated from the year 1673, when Matthew Locke set to music the "Psyche" of the poet Shadwell. In 1727, Gray produced his "Beggar's Opera," written by way of burlesque, to ridicule the Italian Opera. This work had a *run* of sixty-three successive nights, and is still a favourite with the public. The songs were adapted to the most popular tunes of the time; the words are witty and satirical, and most of the melodies are very beautiful. This burlesque opera gave rise to the genuine English Opera, which has continued down to our own time, although in many instances it partakes of a mixed character, and so-called English Operas have little in them that is English, except the words, and these mere translations.

Among the most successful of English Opera composers were Dr. Arne, Jackson, Linley, Dibdin, Shield, Arnold, Storace, Bishop, Barnett, and some others. The "Artaxerxes" of Arne was written in 1762, to prove that the English language was not repugnant to music, as many had supposed. The attempt succeeded triumphantly. In the opera called "Love in a Village" are some beautiful melodies, by various composers; one by Arne, "Gentle youth, ah! tell me why!" is especially beautiful.

The English Opera House is in the Strand. The former theatre (called the Lyceum) was destroyed by fire, in 1829. The present building was erected by the architect, Beazley, in 1831–4. The pit is 39 feet wide. The depth from the back of the pit to the curtain, is 50½ feet. The curtain is 32 feet wide.

Weber's Opera, "Der Freyschutz," was produced in English, for the first time, in the English Opera House. It had a most successful career, and was performed in almost every theatre in London. Other German Operas were brought out at this Opera House; Winter's

"Interrupted Sacrifice," Marschner's "Der Vampyre," &c., and were well performed, and well received.

COVENT GARDEN THEATRE, BOW STREET, LONG ACRE.

This theatre was built by the architect, Sir R. Smirke, in the year 1809; its predecessor, a much smaller theatre (in which the dramatic school of acting had been raised to the highest excellence by Garrick, Kemble, Siddons, and others, their disciples), was destroyed by fire. The stage of the present theatre is 55 feet in depth, and 86 feet in width. The curtain is 32 feet wide. The depth from the curtain to the back of the pit is 66 feet, the greatest breadth 51 feet, the length of the pit floor being 54 feet. This theatre has a saloon, the dimensions of which are 56 feet by 19 feet.

The decline of the public taste for the real drama has caused the transformation of this theatre into an Italian Opera House, and the performances here are scarcely rivalled at the Queen's Theatre. The superior taste of the public has been tried and proved by the performances of Mozart's operas, which have been rapturously received by large audiences, and their immense superiority over the frivolous compositions of the degenerated school established by Rossini is proved every time the public has an opportunity of expressing its judgment.

The Italian Opera was established at the Theatre Royal, Covent Garden, in the year 1847, the theatre having undergone great improvements, and the Company consisting of first-rate and well-approved singers. The Orchestra, under the most celebrated man of the day, is also first-rate.

Operas had been performed at different times, long before the introduction of the Italian Opera, at this theatre. Besides an English version of Mozart's operas, very many of our own "Mozart," Sir Henry Bishop, continued for a long time to give pleasure to the public. In the year 1826, Weber conducted his exquisitely beautiful opera, "Oberon," written for this theatre; and in which Miss Paton, Madame Vestris, and Braham, were the principal performers. In the year 1832, Beethoven's opera of "Fidelio," and Mozart's "Don Juan," were performed by a company of German artists. Mendelsohn's "Antigone" was performed here (in English), in 1845.

DRURY LANE THEATRE.

As at the Covent Garden Theatre, so also at this operas have been performed, but there is no established opera. When Weber's "Der Freyschutz" was in vogue in London, it was nowhere better represented than at this theatre.

The old Drury Lane Theatre was devoted to the legitimate drama, but after its destruction by fire (just after the destruction of Covent

Garden Theatre by the same element), and the erection of the present noble building, the drama declined in public taste, and the theatre has been devoted to a variety of purposes.

The present building was erected in the year 1811–12, by Benjamin Wyatt. The stage is 48 feet wide, and 80 feet deep. The greatest breadth of the pit is 56 feet, the height from the floor of which is 65 feet. There is a distance of 64 feet from the curtain to the back of the pit. The breadth of the curtain is 32 feet. There is a saloon 90 feet long and 26 feet wide.

THE PHILHARMONIC SOCIETY.

This, the most eminent musical society, is composed of forty members and fifty associates, all professors of music, instrumental or vocal; to whom are added twenty female associates, eminent for their professional acquirements. Moreover, there are honorary members of this society, selected from among the most celebrated foreign musicians.

The "Band" of the Philharmonic Society is the noblest in the world; it consists of artists of first-rate talent, not one of whom but is capable of conducting an orchestra.

Except oratorios, and music requiring immense masses of performers, this Society performs all the most classical music, whether for a full orchestra or a small one, together with solos on all kinds of instruments. Every foreign artist of extraordinary merit, vocalist and instrumentalist, is engaged for the concerts given by this Society.

Mendelsohn appeared in the orchestra of the Philharmonic Society, in the year 1829. His lesser works of the oratorial kind have been performed herein, but they are more suited to such societies as the Sacred Harmonic than to this.

The concerts are given in the Hanover Square Concert Rooms, the public at large being the subscribers and patrons.

THE ROYAL ACADEMY OF MUSIC.

This Academy was incorporated by Royal Charter, in the year 1830. The pupils are instructed by chosen professors, in every branch of musical education. Since the foundation of this Academy, a large number of instrumental performers, of no mean eminence, have gone forth into the various orchestras of London; many of the pupils are leaders and conductors of concerts, and eminent solo performers. Several of them are distinguished also as composers. Concerts are given by the pupils of the Royal Academy during the fashionable season in London, in the Hanover Square Concert Rooms, to which the public are admitted. The first concert took place on the 8th of December, 1828, two years before the charter of incorporation was granted.

EXETER HALL, STRAND.

This building was erected in the years 1830–31, by Gandy Deering, in the Greco-Corinthian style, since much improved. The Hall, originally intended for public meetings on religious matters, has of late years been much devoted to performances of various kinds of music, but especially the sacred. The sacred music consists principally of oratorios, by Handel, Sphor, and Mendelsohn, and occasionally of purely church music, such as anthems for divine worship. In this gigantic Hall there is an extensive orchestra, in which, on some occasions, as many as 700 or 750 performers, vocal and instrumental, are contained. The oratorio "St. Paul," was performed for the first time in London in this Hall, in the year 1837; and the "Elijah," and other works of Mendelsohn have been heard here, sometimes under the conduct of the composer himself.

Oratorios are of ancient date, and were originally ecclesiastical representations of scriptural or legendary subjects, for the edification of the people. It is said, the ablest poets and composers were engaged to produce, and set to music, dialogues in verse, for the purpose of affording means of enjoying musical entertainments to the nobles and people, on Sundays and Festivals in the Church. St. Philip, of Neri, is said to be the founder of these performances. The subjects were—"Job and his Friends;" "The Prodigal Son;" "The Angel Gabriel with the Virgin;" "The Mystery of the Incarnation." They were made very attractive. Some of the poems were printed under the title of "*Laudi Spirituali.*" One of the most remarkable of these early oratorios was called "Rappresentatione di Anima e di Corpo," (the Representation of the Soul and Body.) It was performed in chant-recitative, on a stage erected in the Church of Santa Maria della Vallicella, at Rome, with scenes, dances, &c., after the style of the ancient Greek drama.

One of the earliest writers of oratorio music, was Stradella, who produced his "Oratorio di S. Gio Battista," in the year 1670. Zeno the poet produced seventeen oratorios, called "Azioni Sacra;" most of these were set to music by Caldara. One of them, called "Sisera," was performed in 1717. Metastasio wrote seven "Azioni;" Caldara set two of them to music. One of them, "La Passione," was afterwards set by Iomelli.

The oratorio was introduced into England in the year 1720, by Handel, in his "Esther." This was performed afterwards, in 1732, in the King's Theatre, by command, *without any acting of the characters*, the house being merely fitted up as a concert room for the occasion.

From the year 1737, until the establishment of the oratorial performances in Exeter Hall, there was always an oratorio performed twice in a week during Lent, in the theatres Covent Garden, Drury Lane, &c. Handel, after his losses in the Academy of Music, gave performances during the Lent season, in imitation of the *Concerto*

Spirituali, and called them oratorios, at Covent Garden Theatre, most of them were composed for the occasion. The oratorio of "Deborah," was first performed in 1733; "Israel in Egypt," in 1738; "Saul," in 1740; "Messiah," in 1741; "Samson," in 1742; "Judas Maccabeus," in 1746; "Joshua," in 1747; "Solomon," in 1749; and "Jephtha," in 1751.

THE SACRED HARMONIC SOCIETY.

This amateur musical Society was established in the year 1832. The members originally met in the small room at Exeter Hall, and performed oratorios, masses, and such like music, to a small number of friends admitted by members' tickets. But for some time past the performances have been given in the large Hall, the members being assisted by a considerable body of professional performers. The oratorios of Handel, Spohr, Beethoven, Mendelsohn, &c.; anthems; masses by Mozart, Haydn, Beethoven, &c., are performed by an orchestra consisting of from 500 to 700 persons. This Society has acquired a high musical position, from the excellence of its concerts and its spirited conduct.

THE LONDON SACRED HARMONIC SOCIETY.

This is an off-shoot from the "Sacred Harmonic Society," and, like it, holds its meetings in the large room at Exeter Hall. The performances of this Society are exactly similar to those of the parent Society.

THE CECILIAN SOCIETY.

This is the oldest Society in London, wherein the members meet for the practice and performance of sacred music, of the oratorio kind. It was established in the year 1785, and from it many of our most valuable chorus-singers, male and female, as well as some very efficient violinists, have proceeded; at one time it was the only seminary for good chorus-singers. The meetings of this Society are held in the Albion Hall, in London Wall, twice in each month. Visitors are admitted by members' tickets.

THE CHORAL SOCIETY.

This charitable institution was established in the year 1791. Her Majesty the Queen, the Duchesses of Gloucester and Kent, the King of Hanover, and the King of the Belgians, are the patrons and patronesses. The Society has also the patronage of the Duke of St. Alban's, the Earl of Bandon, Earl of Westmorland, the Lord Mayor, and many others of the nobility and gentry of England.

THE ROYAL SOCIETY OF MUSICIANS.

This Society was established in the year 1738; George Frederic Handel being one of its earliest members, and greatest benefactor. It was incorporated in the year 1790, and is managed by twelve governors, and a court of forty-eight assistants. There are nearly 200 members, vocalists and instrumentalists, who contribute about 500*l.* per annum to its funds.

This Society is instituted for the relief of decayed musicians, their widows and orphan children. It has a large fund, consisting of the donations and bequests of many charitable persons. Handel bequeathed 1000*l.* at his death, and during his life devoted to the funds of this charity the proceeds of performances of several of his own compositions. Many other persons have given large sums. King George the Third gave 500 guineas; Signora Storace, the celebrated vocalist, left 1000*l.*; a Mr. Crossdill, also left 1000*l.*; a Mr. Earl, 754*l.*; a Miss Fenn, 1000*l.*; and various sums of 100*l.*, 200*l.*, and 300*l.*, have been at times bequeathed to this Society. Kings George the Fourth and William the Fourth were generous benefactors by their annual donations. The Queen is patroness. Prince Albert, the Kings of Hanover and Belgium, the Duke of Wellington, the Earls of Westmorland and Cawdor, and the Earl Howe, are patrons. The officers of the Society consist of a Chaplain, an honorary Council, four honorary Physicians, an Oculist, four honorary Surgeons, a Banker, an honorary Solicitor, a Treasurer, Secretary, and Collector. The meetings for business are held in the Society's room, in Lisle Street, Leicester Square.

The funds of this Institution were considerably augmented by the receipt of 2250*l.*, being one-fourth share of the net profits of the Festival which took place in Westminster Abbey, in the year 1834. The income of the Society is about 3000*l.*, its expenditure about 2500*l.* The proceeds from all sources, including honorary, life, and annual subscriptions, which amount to about 300*l.*, interest of stock, &c., in the year 1848, was 2955*l.* 9*s.* 2*d.* The total amount of monthly payments, temporary reliefs, funeral expenses, premiums of apprenticeships, benefactions to aged claimants, indigent musicians' widows, and others having no claim on the charity, officers' salaries, &c., was in the same year, 2454*l.* 7*s.* 8*d.*

This Society gives an Annual Festival in the Freemasons' Hall, in Great Queen Street, when the public are invited to dine with the patrons and members. After dinner there is a performance of vocal and instrumental music, including a fine band of wind instruments, the company being entertained in the intervals between the various toasts and speeches, with songs, glees, madrigals, &c. During the evening the band performs a grand march, composed for this festival by the great Haydn. Ladies are admitted to witness this festival, refreshments being amply provided for them in an ante-room.

THE SOCIETY OF FEMALE MUSICIANS.

This excellent Society was established in the year 1839, "to provide against the miseries and deprivations attendant upon a state of extreme poverty, whether it arise from old age, or sudden infirmity, and to extend to the female professors of music of the United Kingdom (who may become members), all the benefits and blessings which flow from an institution similar to that of the Royal Society of Musicians."

The original promoters of this charitable institution were eighteen talented and distinguished female musicians (vocal and instrumental). The first concert given for the benefit of the charity took place in June, 1840.

THE SOCIETY OF BRITISH MUSICIANS.

This is a Society of young musicians, many of whom possess considerable talent. The members perform one another's compositions in public, for which purpose they give concerts during the fashionable season in London. The members direct their own compositions. The compositions are vocal and instrumental.

THE MADRIGAL SOCIETY.

This is a Society of noblemen and gentlemen amateur vocalists, who meet together in the Freemasons' Tavern, and, after an excellent dinner, perform, with the assistance of the choristers of Westminster Abbey and the Chapel Royal, the beautiful madrigals composed in the sixteenth and seventeenth centuries.

The origin of this Society was humble; its members were mostly engaged in business as mechanics and shopkeepers. The earliest date of its foundation is 1741. The subscription was three shillings per quarter, with an additional fee of eight shillings. In the season 1749–50, the subscription was raised to four shillings and sixpence; in 1756, to six shillings and sixpence; it was again raised to ten shillings in 1785, the admission fee being also raised to one guinea. The members now regaled themselves with a supper, for which there was an additional subscription of two shillings each person; the meetings (which hitherto were weekly,) now took place once in a fortnight. In 1795, the supper charge was two shillings and sixpence for members, four shillings for visitors; the Society also received professional assistance, for whose supper there was a charge of three shillings. The Society did not dine together regularly, but had excursions into the country, or suburbs. It appears that the members dined together in 1798, and paid fifteen shillings each for their dinner; it is evident that the members were now a superior class of persons, although they did not regularly hold their dinner meetings. The present regulations are owing to the patronage, support, and influence of the late president, Sir John Rogers, who first visited the Society in 1839, from which time it has assumed a high position. The president at this time (1851) is Lord Saltoun. There has been for many years an Anniversary Festival of the Madrigal Society, which takes place in January, in the Freemasons' Hall, at which from sixty to a hundred voices are heard singing the unrivalled madrigals, motetts, &c., of the great masters of vocal harmony. The ordinary meetings take place in the Freemasons' Tavern, on the third Thursday in the month, during the season, which commences in October. At these meetings, as also at the anniversary meetings, visitors, friends of members, are admitted.

THE WESTERN MADRIGAL SOCIETY.

This Society was established in the year 1840, for the same purposes as the older society of the same name, viz., for the practice of motetts, anthems, and madrigals of the ancient masters. But it differs from the parent Society, inasmuch as it encourages the art of writing madrigals by musicians of the present day, and more than one prize has already been awarded.

This Society meets in the Royal Society of Musicians' Room, in Lisle Street, Leicester Square, once every fortnight during the season, which commences in November, and continues for ten meetings. After the season is over, the members have an Anniversary Festival, to which they invite their friends and a large number of talented vocalists accustomed to this class of music.

Ladies are also invited to witness the evening's performance, and refreshments are provided for their comfort. The members of this Society are highly respectable, and the music is performed in a very superior manner at all the meetings. Visitors, friends of the members, are admitted.

THE NOBLEMEN AND GENTLEMEN'S CATCH CLUB.

This select and elegant Club was established in the year 1761, by several gentlemen and noblemen, and it has ever been distinguished by the high rank of its members. So fashionable has this Club been, that it has at all times had some of the Royal Family amongst its members. The King of Hanover is still an honorary member; his late brothers were all of them members of this Club. The Catch Club holds its meetings at the Thatched House Tavern, in St. James's Street, on every Tuesday during the season, from March to the end of June. Besides the subscribing members there is a large number of professional gentlemen, honorary members, who are selected from amongst the most eminent and respectable English singers of this peculiar class of compositions, viz., glees, catches, &c., for the performance and enjoyment of which this Club was instituted. The Catch Club has awarded an immense number of prizes for compositions produced by the honorary as well as subscribing members. Between the years 1763 and 1794, nearly 150 prizes were contended for; since which latter date there have been about thirty more awarded. Amongst the honorary members, there are several composers whose glees are of a very superior order, and great favourites with the lovers of this kind of music. The Catch Club has for several years closed its season with a banquet given to the ladies.

THE GLEE CLUB.

This is a Club of gentlemen, mostly merchants, who dine together, and after dinner promote the practice of glee singing. This Society was founded in the year 1787. Before this time, a few professional and amateur singers used to assemble at each other's houses; one of the members, a Dr. Bever, had a valuable library of old music. At the house of this gentleman, the party assembled used to sing motetts, madrigals, glees, catches, &c., and such was their mutual delight, and the increase of their numbers, that at length it was determined to form a Society. The first meeting, as such, took place on the 22nd of November, 1787. Its members were clergymen and other gentlemen amateurs of vocal music, and honorary members selected from the professional singers and teachers, distinguished for their talent and respectability. This Club now holds its meetings in the Freemasons' Tavern. Visitors, friends of the members, are admitted at every meeting.

The Society consists of about thirty subscribing, and about ten honorary or professional members. There is, generally, a considerable number of professional visitors also invited to the meetings.

THE MELODISTS' CLUB.

This Society was established in the year 1825, for the encouragement of the art of writing melodies; that is, compositions in the song and ballad style, and other kinds of solo music.

The late royal Dukes of Sussex and Cambridge were patrons of this Club. The vice-presidents are the Earl of Westmorland and Lord Saltoun. The other members consist of highly respectable gentlemen. There are also honorary members, chosen from amongst the best English vocalists. The Club holds its meetings in the Freemasons' Tavern. Visitors, friends of members, are admitted. Nearly every eminent musician is invited to dine with the Club, on his arrival in London. Thalberg, Sainton, Sivori, and other artists, have exhibited their eminent talents at these meetings. This Club has given several banquets to the ladies at the close of its seasons.

There are various minor musical clubs in London, the principal of which are—"The Purcell Club;" "The Round, Catch, and Canon Club;" "The Abbey Glee Club;" "The Adelphi Glee Club," &c.

The *Purcell Club* was established in the year 1837. Its members are professional vocalists, mostly belonging to the metropolitan choirs. The members meet annually in Westminster Abbey, and, with the assistance of other vocalists, their friends, perform, during divine service, a number of the exquisite church compositions of the renowned Henry Purcell, a court musician in the reign of Charles the Second, whose works contain all, or nearly all, the refinements of modern art. After service the members and their friends dine together, and after dinner there is a performance of the secular compositions of this great master.

The *Round, Catch,* and *Canon Club* was established in 1843, by a few members of the metropolitan choirs, patronized by several gentlemen amateurs of this class of music. The members and their friends dine together in the Freemasons' Tavern, during the months of November, December, January, February, and March.

The *Abbey Glee Club* was established in the year 1841, by a number of young men who had received their musical education in the choir of Westminster Abbey. This Club holds its meetings at the Freemasons' Tavern, where the members, assisted by the young choristers of the Abbey, perform sundry glees, &c., in the evening. Several of the members have distinguished themselves as composers of this delightful kind of music.

The *Adelphi Glee Club* takes its name from having been founded by two brothers. It was established in the year 1833, and holds its meetings in the London Coffee House, on Ludgate Hill. This Club meets on alternate Fridays, during the season, from the end of October until May. The members, assisted by a few professional gentlemen of superior talent, perform glees in a delightful manner.

The Club dines together previously to the opening of the season. To all its meetings visitors, friends of members, are admitted.

THE CHORAL HARMONISTS' SOCIETY.

This is a Society of amateurs, and was established in the year 1834, for the performance of Mozart, Haydn, and other composers' masses, Handel's oratorios, serenades, &c. The orchestra, consisting of amateur and professional performers, is on a small scale. The principal vocalists are professional, the chorus chiefly amateurs. The very agreeable concerts given by this respectable Society commence in the month of October, and continue during the winter season. The subscribers have additional tickets, by which visitors are admitted to witness the performances. The performances take place in the large room at the London Tavern.

THE AMATEUR MUSICAL SOCIETY.

This Society is composed of noblemen and gentlemen amateur instrumentalists. The performances are excellent, and especially interesting. In this Society the double or contra-bass performers are the Duke of Leinster and Sir Archibald Keppel. The Earl of Arundel and Sir Percy Shelly perform the trumpet parts. The honorary secretary, Henry Leslie, Esq., is an excellent composer of music, and his works are frequently performed. This Society's meetings are held in the Hanover Square Concert Room. It was established in the year 1846.

THE MUSICAL UNION.

This is also a Society of noblemen and gentlemen amateurs, and was established in the year 1845. It is patronized by His Royal Highness the Prince Albert. The Earl of Westmorland is Vice-

President. The committee consists of a large number of noblemen and gentlemen. This Society differs from the "Amateur Musical Society" in its performances as well as in the class of performers. In the "Musical Union" meetings the music performed is "Chamber," that is "Drawing-Room," music, viz., trios, quartetts, and other similar concerted pieces for solo performers. This Society gives eight concerts during the season, commencing in March and ending in July, in Willis's Rooms, St. James's Street. Visitors are admitted by tickets, and free admissions are given to ladies and gentlemen of artistic, literary, and scientific fame.

THE ANNIVERSARY FESTIVAL OF THE SONS OF THE CLERGY.

This is the festival of a charitable institution, the funds of which are devoted to the support of decayed clergymen, their widows and orphans. The Society is incorporated and patronized by the highest personages in the kingdom. The festival takes place in St. Paul's Cathedral, in the Afternoon Service, about the end of the month of May, and consists of the performance of sundry fine anthems, as well as the usual services of the sterling English Church School of Music. At this festival there is a large attendance of the Patrons, the Archbishops, Bishops, and Clergy, the Lord Mayor, Sheriffs, and Aldermen, who arrive in state. These all form a procession in the Cathedral previous to the commencement of divine service. There is an extraordinary and numerous choir of singers on this occasion, and the musical performance as well as the music itself, is of a very high order. There is, moreover, a sermon, preached by some very eminent clergyman, and the members of the Corporation dine together at the Hall of one of the City Companies, after divine service. There is a collection made for the benefit of the institution, both in the Cathedral and at the Hall.

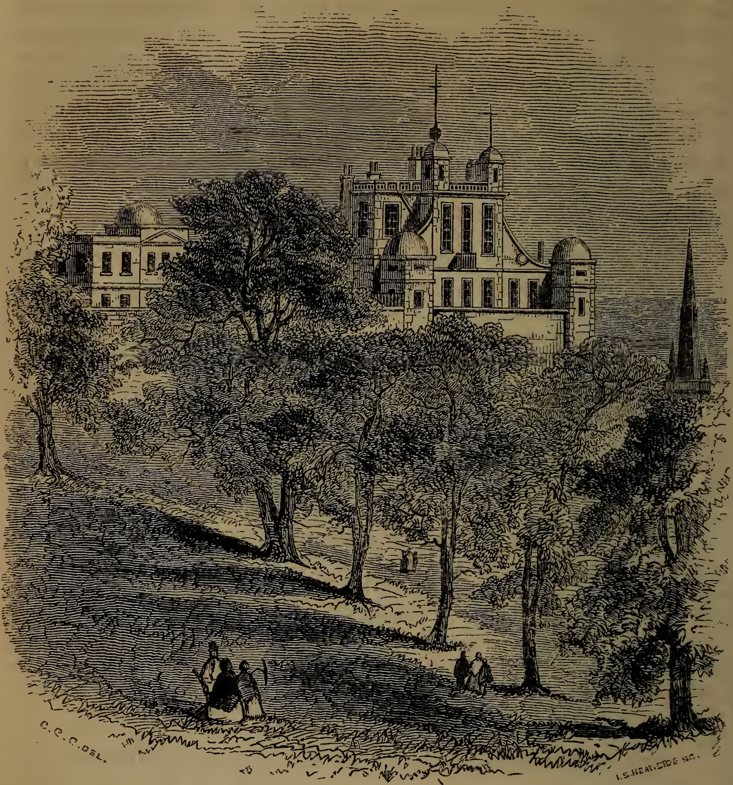
THE ANNIVERSARY MEETING OF THE CHARITY CHILDREN.

This is perhaps the finest spectacle which can be witnessed in this metropolis—the assemblage of between *seven and eight thousand* boys and girls, clothed and educated by voluntary subscriptions. The effect of the mass of treble produced by this multitude of youthful voices is beyond description, and must be witnessed by all who desire to hear the harmony produced by unison singing.

There is a large and effective choir of experienced professional singers to assist in the complicated music of the Church. The meeting takes place at Morning Service. It is attended by the City Authorities, in state. Members of the Royal Family, and many of the nobility, patronize the meeting with their presence, and support its object.

The meeting takes place about the beginning of June, in St. Paul's Cathedral, the children being elevated on galleries round the dome, the congregation filling the area under the dome and in the nave.

THE OBSERVATORIES OF LONDON AND ITS VICINITY.


C. C. C. DEL.
I. S. HEAVISIDE SC.

ROYAL OBSERVATORY, GREENWICH.

One of the fruits of the growing intelligence of the present time is the great interest with which the public in general regard subjects and institutions of a purely scientific nature. Astronomy, in every age, has been felt to be that science which attracts the attention most strikingly; but in the present age, when so great numbers of well-educated people can appreciate and understand its principles, and when the most brilliant discoveries have followed each other with unexampled profusion, it is natural that the public attention should be turned eagerly towards those institutions in England which have advanced the science, at the same time that their very existence and organization form a remarkable characteristic of the period in which we live.

English observatories of the present day are of two classes, public and private. The public observatories are in general supported either by the Government of the country or by the universities*; the private observatories have been erected and maintained by the munificence of our gentry, clergy, and merchants. Some of the latter institutions have nobly repaid the expense and labours entailed upon their proprietors by some brilliant discovery. Thus, to Mr. Bishop's observatory, in the Regent's Park, we owe not only the discovery of several comets, but three of the new planets, viz., Flora, Iris, and Victoria; to Mr. Cooper, of Markree, in Ireland, we owe the discovery of the planet Metis; and to Mr. Lassell, of Starfield, near Liverpool, we owe the discovery of a satellite of Saturn, besides other discoveries and very many valuable observations which his widely-spread reputation prevents the necessity of mentioning; lastly, to Captain Smyth's labours in his observatory, formerly existing at Bedford, we owe a well-observed catalogue of double stars, a most valuable contribution to astronomical science.

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* One exception to this exists in the case of the Liverpool Observatory, which was established and is supported by the corporation of the town, its chief object being to supply accurate observations for giving the time at that port, and to enable the masters of vessels to get their chronometers well tested and rated.

In our description of observatories we are necessarily confined to those which lie either in the immediate neighbourhood of London, or which are accessible by an easy journey.

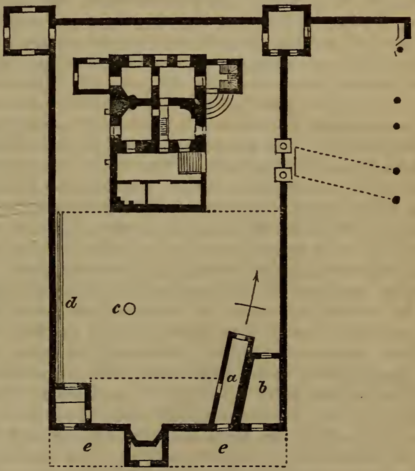
The chief instruments in different observatories resemble each other so closely that it will be sufficient to describe with any detail those of the National Observatory of Greenwich, the first on our list; and as its history is also in some degree the history of modern astronomy, we shall scarcely need to apologize for entering somewhat minutely into the historical details which are necessary for tracing its progress from its first foundation under Flamsteed, to its proud position under its present eminent director, Mr. Airy; from the infancy, in fact, of accurate observing and mechanical skill, to the perfection of both in the highest efforts of the engineer and the optician in the framing of admirable instruments, and in the skilful use of them by persons trained in all the requirements of the theoretical and the practical astronomer.

The Royal Observatory of Greenwich was founded in the reign of Charles II., in the year 1675. The direct object of its institution was the solution of that long-vexed and all-important problem, the discovery of the longitude of a ship at sea. It was readily understood that, for this purpose, accurate observations of the moon were indispensable, and the formation of an accurately-observed catalogue of stars highly necessary. It was also equally evident to the scientific men of the day, that no observations existed that were at all adapted for the purpose. The catalogue of Tycho Brahe gave only rough approximations to the places of a tolerably large number of stars, made with very rude instruments, and without the use of the powers of the telescope. It was, therefore, determined to found a national observatory, for the express purpose, as the warrant of the first Astronomer Royal expressed it, "to rectify the tables of the motions of the heavens and the places of the fixed stars, so as to find out the so much desired longitude at sea, for perfecting the art of navigation." Through the recommendation of Sir Jonas Moore, Surveyor-General of the Ordnance, who had taken particular interest in the matter, Flamsteed was chosen to be the first Astronomer Royal, with a salary of 100*l.* per annum. The situation for the observatory was at first undecided. Several places were proposed, among which were Hyde Park and Chelsea College; but, on the advice of Sir Christopher Wren, Greenwich Hill was ultimately chosen, and he was requested to send in a plan of the observatory. The sum of 500*l.* in money was allowed by the King; the bricks were supplied chiefly from the ruins of Tilbury Fort, and other materials were taken from a gatehouse demolished in the Tower. The foundation of the building was laid on August 10, 1675; and the roof was laid, and the building covered in, by the Christmas of the same year. Thus economically built and endowed was the present far-famed National Observatory of Greenwich: but the choice of an astronomer was wisely made: his zeal overcame all obstacles; and during his lifetime the observatory rose to that first rank which it has ever since maintained amongst similar institutions.

John Flamsteed, the first Astronomer Royal, was born at Denby, near Derby, on August 19, 1646, and was educated at the free school of Derby. He did not receive much benefit from school education beyond the age of 14, through severe illness (occasioned about that period from imprudently bathing), of which he felt the effects during his whole life. From this time he devoted himself for several years, unassisted and self-taught, to astronomical and mathematical studies; and at length, about the year 1669, his talents attracted the attention of several fellows of the Royal Society. Among other scientific persons, he became familiarly acquainted with Sir Jonas Moore, who afterwards became his warmest friend and patron. He resided for some time at Sir Jonas's house in the Tower, and during this period made many astronomical observations, which still exist recorded amongst his manuscript papers, and are printed in the first volume of the *Historia Cœlestis.* By Sir Jonas's interest he soon afterwards, as has been already stated, was appointed Astronomer Royal.

He was enabled to remove to the observatory on July 10, 1676; and it is interesting to be informed from his own pen of the means which were placed at his command for fulfilling the King's wishes. At the same time, it may be worth while to consider what was the state of practical astronomy at the time when he began his labours. With regard to the latter, neither telescopes nor clocks had yet been introduced into observatories; the star catalogue of Tycho Brahe was derived from observations made with instruments furnished with plain sights; and this, together with the Rudolphine tables of the sun, moon, and planets then known (which were constructed from elements quite as rough), were the only materials existing for the use of the theoretical astronomer. Flamsteed, who knew what was needed, and who had a much better idea than any man of his time of the means necessary for producing comparatively good observations, set about his task with vigour. He was totally unprovided with instruments at the public expense, but he brought with him to the observatory an iron sextant of 6 ft. radius, and two clocks, given him by Sir Jonas Moore, together with a quadrant of 3 ft. radius, and two telescopes, which he had brought with him from Derby. With these instruments he worked till the year 1678, when he borrowed from the Royal Society a quadrant of 50 in., which, however, he was allowed to retain only a short time. It must be borne in mind that the advantages of the system of meridian observations were unknown, or nearly so, at this time. The sextant was employed to measure the distances of an object to be observed from some standard stars, or stars whose places were supposed to be better known, and a laborious calculation was necessary to deduce the resulting place of the body in every instance. This gave, however, no means of fixing the place of the body with respect to the equinox; and Flamsteed, finding the absolute necessity for an instrument fixed in the plane of the meridian, applied to the Government. He was not denied; but being wearied with repeated promises which were never kept, he at length resolved to make a mural arc at his own expense, and this instrument was finally erected, and divided with his own hands in 1683. It was, however, a failure; and his observations were continued for several years longer with the sextant. The minor obstructions and vexations to which Flamsteed was subjected, we have not space to mention. It is sufficient to say that, during the whole time that he officiated as Astronomer Royal (nearly half a century from his first appointment), he was not furnished with a single instrument; he received a precarious salary of 100*l.* a year, as the sole reward of his labours; and for this inadequate stipend he was charged, in addition, with the education of two boys from Christ Church Hospital. The only assistance he received was that of a labourer to assist him with the sextant, and other assistants and computers he provided at his own expense.

At length, in 1688, finding himself in better circumstances on the death of his father and his presentation to a living, he determined to construct a new mural arc, stronger than the former; and this instrument, famous as really commencing a new era in observing, was constructed by Mr. Abraham Sharp, his friend and assistant, at an expense of 120*l.*, no portion of which was reimbursed to him by the Government. All Flamsteed's former observations were of little value; no fundamental point of astronomy was settled by them; and they merely served for forming a preliminary or observing catalogue of objects to be well observed with his new instrument. From the date of the use of this instrument, 1689, the useful labours of Flamsteed commenced; every observation after this was permanently useful, and could be applied to determine some important point. With this instrument, after verifying its position and determining its adjustment, he set about the determination of those cardinal points in astronomy, the position of the equinox, the obliquity of the ecliptic, and other fundamentals, without which the correct positions of the fixed stars and the planetary bodies could never be ascertained. His methods and processes are explained by himself in the *Historia Cœlestis;* they are many of them novel and ingenious, and they bear most honourable testimony both to his ability and zeal. Our limits prevent us from entering upon that long-vexed and famous question of his quarrel with Newton and Halley, with respect to his obligations of printing his observations. It is sufficient to say, that though the vexations to which he was subjected must have been most grievous, yet science reaped the benefit of the injustice done him, and his own fame has been put upon a more solid foundation, by the compelled publication of his works. Halley had published an imperfect and garbled account of his observations, which had been forced from him. This compelled him to undertake the publication of his works, in a great measure at his own expense. He lived only long enough to see part of the second volume of the *Historia Cœlestis* through the press; and the work was finished and published six years after his death, or in the year 1725, by the voluntary labours of his friends, Mr. Crosthwait and Mr. Abraham Sharp.



PLAN OF GREENWICH OBSERVATORY,
FROM FLAMSTEED'S DRAWING.

a. The room for the mural arc.
b. The room for the sextant.
c. A perpendicular pole for the moveable telescopes.
d. The place for keeping the telescope-tubes.
e. A flower-garden.
f. The well in which observations were sometimes made.

The preceding plan of the observatory, as it existed in the time of Flamsteed, will perhaps be interesting to the reader. The original drawing was made by Flamsteed himself, and still exists amongst his manuscripts at the Royal Observatory; it gives a very intelligible idea of the extent of the buildings and grounds at that time. The towers, which are now surmounted by the north-east and north-west domes, were then in existence under the name of summer-houses, but were then unconnected with the central building. The boundaries of the inclosed space, and the situations of the different buildings, are sufficiently explained in the drawing.

Flamsteed was succeeded, in 1719, by Dr. HALLEY (then in his 64th year), who for nineteen years laboriously conducted the business of the observatory without any assistant. Though his observations were never published, yet we may consider that a most important advance was made in his time in the science of astronomy. The observatory was at this time totally unprovided with instruments; the executors of Flamsteed having claimed and carried away those that had been set up and used by him. In 1721, however, Halley procured a small transit-instrument, and mounted it in an apartment at the north-west corner of the building, on the spot afterwards appropriated to the large 25 ft. zenith-sector. This instrument, which is still preserved at the observatory, is of very objectionable construction, the telescope not being in the middle of the axis, and a series of bracing rods being most injudiciously applied to it. However, its introduction was the most important step that had been made. It is the most simple and effective of all astronomical instruments; and up to the present time, the only changes that have been made in the means for observing the right ascensions of the heavenly bodies, are those which secure to it the utmost possible stability and accuracy of workmanship and adjustment. With it alone Halley continued to make observations of the moon till the year 1725, when an 8 ft. mural quadrant, made by Graham, was set up and directed to the south. This admirable instrument, which was afterwards used with so much effect by Bradley, was the best instrument of its time; and with it alone Halley continued for a long period to make observations of the moon in both elements, having given up the use of the transit-instrument. In the year 1737 he became paralytic, and died in 1742, being succeeded by the illustrious Dr. BRADLEY.

The discoveries of this eminent astronomer are so well known, that it will be needless to do more than allude to them in their connexion with and their effect on the fame and character of the observatory.

Bradley was born in 1692, and, after taking his degree of B.A. at Oxford, in 1714, he resided principally at Wanstead, in Essex, with his uncle, Mr. Pound. This gentleman was at that time probably the best observer in England. He had fitted up an observatory, furnished, amongst other instruments, with a transit-instrument, some time before the introduction of that instrument at the Royal Observatory by Halley; and under him Bradley acquired that accuracy and care in observing that afterwards distinguished him.

On the death of Dr. Keill, in 1721, Bradley had been elected Savilian Professor of Astronomy in Oxford, and in 1724 Mr. Pound died. These events, together with some observations and calculations relating to a comet discovered by Halley in 1723, are almost all that is known of him till the memorable year 1726, when he began a series of observations from which resulted two of the greatest discoveries of the age.

The two great discoveries of aberration and nutation were made by a series of observations begun at Wanstead in 1727, and continued beyond the period of a revolution of the moon's node. He had begun his observations at Kew, in 1726, with a zenith-sector belonging to Mr. Molyneux, whose telescope was rather more than 24 ft. in length; but in 1727, a sector of 12 ft. radius was made for him by Graham, and set up at Wanstead. This famous instrument was afterwards removed and set up at the Royal Observatory, and on a grant being made in 1749 for new instruments, was purchased by the Government. It is at present suspended on the wall of the transit-circle room of the Royal Observatory; having been recently returned from the Cape of Good Hope, where it was used by Mr. Maclear in his recent survey.

The first discovery, viz., that of the aberration of light, was announced by Bradley in the year 1729, in a letter to Dr. Halley, and read before the Royal Society, and printed in vol. xxxv. of the *Philosophical Transactions;* the latter, of the nutation of the earth's axis, was announced in a letter to the Earl of Macclesfield, read before the Royal Society in 1748, and printed in vol. xlv. of the *Transactions.*

Early in the year 1742 Halley died; and chiefly through the patronage of Bradley's friend, the Earl of Macclesfield, he obtained the appointment of Astronomer Royal. It is interesting to know that it was the express desire of Halley that Bradley should be his successor, and he even wished to resign in his favour, but the appointment did not take place till the month following his decease. At the time of Bradley's accession to the office of Astronomer Royal, the instruments consisted chiefly of the transit-instrument and the south mural quadrant, made by Graham, above mentioned; and after bestowing very considerable care upon them, and making several alterations which were indispensable, Bradley began to observe at the beginning of the year 1743. The first change in the organization of the observatory under Bradley's direction which deserves especial notice is the employment of a regular assistant. Immediately on his appointment, he obtained the services of his nephew, Mr. John Bradley, and the choice was singularly fortunate. Mr. Bradley was a man of talent, and of unwearied industry; and after serving several years at the observatory with great efficiency, he entered the navy, and eventually obtained the appointment of Second Mathematical Master at the Royal Naval College at Portsmouth. Bradley and his nephew continued to observe for some years laboriously with the old instruments, but it was at length discovered that the time and labour had been in a great degree thrown away through their inefficiency. Halley had himself been conscious of this, and had applied to the Council of the Royal Society, in 1726, for their interest in procuring an additional grant of money, but their representations to the Master-General of the Ordnance were ineffectual. In 1748 Bradley made a representation of the state of the instruments to the Board of Visitors, at their meeting, and drew up a petition to the Lords of the Admiralty, which, after some alteration by the Council of the Royal Society, was forwarded to the Admiralty. The estimated sum of 1000*l.*, which was required, was immediately granted by King George the Second.

The principal additions made to the instruments of the observatory by means of this grant were a new quadrant and transit-instrument, both made by Bird; and a considerable alteration and addition to the observing buildings were now made, for the purpose of erecting the instruments with sufficient firmness and convenience. It is probable that Graham's quadrant was set up by Halley in a room that had not been erected for the purpose, as it was much too small, and the pier was very inconveniently placed with regard to the side walls. The want of height of the room had contributed very much to the damage, and consequent inefficiency, of the quadrant; and the room was now pulled down, and new rooms were built, in nearly contiguous positions, for receiving the two quadrants and the transit-instrument. The new brass quadrant was at first set up against the western wall of the new pier early in 1750, and the old iron quadrant in its ordinary position on the eastern pier, as Bradley's chief object was now to determine the latitude of the observatory, and to obtain observations for the purpose of obtaining data for calculating a table of refractions; and he placed more reliance on the new quadrant than on the old. In 1753 the positions of the quadrants were reversed; the new quadrant occupying the east side, and the old quadrant the west side of the pier, and there they have ever since remained. It has been mentioned that the zenith-sector, used by Bradley at Wanstead, was purchased by the Government. For this instrument two suspensions were made, one with its face east, in the quadrant room, and the other with its face west, in the new transit room; the object of this change of position being to observe with it absolute zenith distances, for correction of the errors of collimation of the quadrants. The telescope of the transit-instrument, which is still preserved at the observatory, had an object-glass of 2·7 in. aperture, of which little more than half was used, and its focal length was 8 ft. The axis of the instrument was 4½ ft. in length; and counterpoises were used to prevent wear of the pivots. Besides these instruments there were added a clock by Shelton, an equatorial sector, and some magnetic instruments; a Newtonian reflecting telescope also was ordered of Short, and is mentioned by Dr. Maskelyne as afterwards forming part of the apparatus of the observatory, though it was not completed for a considerable period. The observatory was now efficiently furnished with instruments; and Bradley continued for nearly 20 years to make admirable use of them in the observations of the sun, moon, and planets, and of a large catalogue of stars.

The observations of the sun, moon, and planets, have been recently rendered available to astronomers by the present Astronomer Royal, Mr. Airy, who, with incredible labour and zeal, undertook the reduction, not only of Bradley's planetary observations, but also of those of Bliss, Maskelyne, and Pond, his successors. The results of these reductions are given in three thick quarto volumes, published at the expense and by direction of the Lords Commissioners of the Admiralty, and whether we consider the inestimable value of the contents of these volumes, the immense labour and responsibility involved in so great a work, the skill and accuracy with which it is conducted, or the gratuitous zeal evinced by it, we may well consider the work as worthy of the reputation of its author, and greater praise in this instance it is impossible to bestow upon it. The results of the star observations are incorporated in the *Fundamenta Astronomiæ* of the illustrious Bessel, in which all the resources of modern analysis have been employed, and the most correct values of the constants of refraction, aberration, precession, nutation, and other astronomical elements, deduced from these same observations, have been used, to give the utmost precision to the results. The names of Bradley and Bessel can never henceforth be separated; and their joint labours have given data which have already enabled us, by comparison with modern observations, to solve many cosmical problems which, without them, would be at the present time impossible. The accuracy of Bradley's observations is, perhaps, on the whole, incomparable; with instruments which are theoretically very inferior to the modern transit-instrument and mural-circle, he has produced observations that scarcely yield to the most refined modern observations made with all the advantages of improved mechanism and methods of observing; he seized at once the highest place both in theoretical and practical astronomy, and left little for his successors but patiently to tread in his footsteps, and to avail themselves of every ordinary and casual improvement that might suggest itself. Yet all this was accomplished by the personal labour of himself and one assistant; and the official remuneration to himself was the same salary of 100*l.* per annum which had been given to Flamsteed, diminished by several office fees. It is, however, gratifying to be able to add that he was not allowed to go altogether unrewarded. The vicarage of Greenwich was offered to him in 1751, and on this being declined, through conscientious scruples, he received a pension from the Crown of 250*l.* per annum, and this was continued till the end of his life. For some years before his death his health declined, and especially during the last two years his ill-health was attended with great and painful depression of spirits. He died in the year 1762, in the 70th year of his age, and was buried near his mother and wife at Minchinhampton.

His successor was Dr. **Nathaniel Bliss**, then Savilian Professor of Astronomy at Oxford, who lived only till March of the year 1764. He left but few observations behind him, and these require no particular mention.

Dr. **Nevil Maskelyne** was appointed to succeed Bliss, and his observations commence with the year 1765. Though the observations were made with Bradley's instruments, and without any great alteration in the methods of observing, yet the fame and character of the observatory were much increased by the steady perseverance with which the observations were uninterruptedly made during his directorship. A principle, too, was established, which has had great influence on astronomy since that time. Flamsteed's observations were regarded as personal property, and were at length published in a complete form by his executors. After Bradley's death his executors acted on this precedent, and claimed his observations. An expensive lawsuit was the consequence between the executors and the Crown, which commenced in 1767 and ended in 1776, and the executors retained possession of the observations. They were afterwards presented to the University of Oxford, and have ever since remained in the possession of that body, though, with their accustomed liberality, they have allowed the present Astronomer Royal to make a manuscript copy of them. On Maskelyne's appointment there was a distinct stipulation that the observations were the property of the Crown, and that they should be printed yearly at the public expense.

Maskelyne's attention was first turned to astronomy by the occurrence of the great eclipse of 1748; and it is an interesting fact, that the same phenomenon similarly affected the mind of the French astronomer Lalande. After graduating at Trinity College, Cambridge, he took orders, and in the year 1755 accepted the charge of a curacy near London. During this period of his life, he occupied himself with his favourite science, and contracted a strict intimacy with Bradley, and made for him several very important calculations. In 1759 he was elected a Fellow of the Royal Society, and in 1761 was chosen by Bradley to observe the transit of Venus, at St. Helena. With the prudence and sagacity which always characterize great minds, he determined to make this expedition subservient to the determination of other astronomical data. Of these, the moon's parallax and the annual parallax of Sirius were the chief; and for this purpose he took with him a sector which the Royal Society had caused to be constructed for this expedition, but which was not completed till the very instant of his departure, and of which the defects were consequently unknown; he took also with him an excellent clock, by Shelton, which had been regulated at the Royal Observatory by Bradley. To his great mortification he found that the sector gave results so irregular as to be utterly unfit for the delicate determinations that were required of it. But even this discouraging circumstance he knew how to turn to the advantage of science; for, by minutely examining the cause of failure of his sector, he discovered that it arose from a faulty mode of suspending the plumb-line, which was in some degree common to all the mural quadrants of that period, and by his representations Bird was induced to turn his attention to the subject, and a new suspension was invented, which, though perhaps not free from all objection, yet was very superior to any that preceded it. Maskelyne made also excellent use of his voyage, in giving trial to all the methods which had been proposed for the problem of finding the longitude, giving especial attention to the method of lunar distances. He gave new formulæ for the calculation of the observations, and rigorously computed the effect of parallax and refraction.

On his return he published the *British Mariner's Guide*, a work at that time of great utility, and rendered still more so through his recommendation of the publication of a nautical almanac, on the plan which had been traced by Lacaille on his return from the Cape of Good Hope, which proposal was afterwards carried into effect with immense advantage to nautical science. Maskelyne's reputation was, by such means as we have mentioned, fully established as one amongst the first practical astronomers of the day; and in 1765, on the death of Bliss, he was appointed Astronomer Royal, as has been before mentioned. His assiduity in performing the duties of his office was wonderful. He scarcely ever left the observatory, except on some important scientific mission; all observations of any delicacy or importance were made by himself, and especially the observations of the moon; he superintended the computations for the *Nautical Almanac*, from the year 1767 to the time of his death, a period of 44 years; he improved the instruments which had been left him by Bradley, and improved also the use of them; he introduced the practice of observing on five wires with the transit-instrument, which was an immense improvement on Bradley's method, who rarely used more than one; he introduced the practice of estimating tenths of seconds; and he devised the plan of sliding the eye-piece across the field of view of the telescopes, for the avoiding of the effects of parallax for the oblique pencils of light.

In 1774 he made his memorable expedition into Scotland, for determining the effect of the attraction of the mountain Schehallien; and, for the observations, he used the same sector which had succeeded so ill at St. Helena, but of which he had altered the suspension and corrected the divisions. It is well known with what consummate skill he conducted the observations, by which the deflexion of the plumb-line was rendered measurable, and from which the mean density of the earth was ultimately deduced. But in general, keeping steadily in view the object of the institution of the Greenwich observatory, viz., the improvement of nautical astronomy, he continued to observe the moon with undeviating regularity, and to apply his observations to the correction of the lunar tables. The best tables of that period were those constructed by the celebrated Tobias Mayer. He edited an English edition of these tables, and added the tables of the horary motions, which were wanting in the Göttingen edition; he also compared the places of the moon computed from these tables with his own observations; and it was finally under his auspices that Mason gave a corrected and augmented edition, which is the basis of Burckhardt's more modern tables. It was during his time that the Board of Longitude was organized by the Government for the encouragement of nautical science, and especially of the problem of finding the longitude at sea; and the efficacy of this Board was mainly due to his unwearied co-operation and wise counsels, as well as to his collateral and most useful labours.

In 1781 he published "The Requisite Tables," to be used in connexion with the *Nautical Almanac*, which is a useful book even at the present period. Maskelyne's star-observations were few, or, rather, he observed a very small catalogue of principal stars; and this is rather unreasonably complained of by Delambre, who yet on the whole appreciates very fairly the merits of this great astronomer. It is to be remembered that Maskelyne throughout his whole directorship was allowed but one assistant for the observatory duties; and the wonder of the practical astronomer of the present time is, not that he left anything undone, but that he accomplished so much with so small means. He chose wisely in determining to confine himself to the lunar and planetary observations, and to the absolute determination of the places of certain fundamental stars as indispensable points of reference, instead of dissipating his energies by attempting vaguely indiscriminate observations of the stars. The fundamentals of astronomy were established in his day, and this in the eyes of the judicious astronomer is his real glory and praise.

Towards the latter part of his life he had serious misgivings concerning the accuracy of the quadrants, which, it began to appear, had considerably altered their shapes. The theory of the construction of instruments had been keeping pace with the improved methods of observing, and with the more enlarged views which were daily gaining ground of the requirements of astronomy. Mr. Pond, afterwards Astronomer Royal, by means of some observations made at Westbury, by himself, with a small circle, had called attention to some discrepancies of the Greenwich quadrant observations; and after a time these observations were recognised as faulty. The superiority also of a complete circle, revolving in the plane of the meridian, to which a telescope could be attached in any position, and by that means errors of division, as well as want of exact circular form, be eliminated, was also sufficiently obvious. Maskelyne, with his usual sagacity, saw the imperfections of the quadrant as compared with the mural-circle, and before his death had given directions to Troughton, the most celebrated artist of his day, for the construction of an instrument of the latter class. He, unfortunately, did not live to see it completed; and the circle was set up and used by his successor, Mr. Pond, in the year 1812, Maskelyne having died on the 9th of February, 1811. At the time of his death he was more than 78 years of age; 45 of which were spent in the routine of his duties as Astronomer Royal, and a great part of the remainder were devoted to the training by which his astronomical eminence was gained. He was for nine years one of the eight Foreign Associates of the Institute, and was in correspondence with all the astronomers of Europe. He enjoyed during his lifetime, and left behind him, a most enviable reputation; his works and observations were eagerly sought for and well appreciated by the men of his own time; and astronomy received an impetus from his labours of which we can scarcely exaggerate the effects.

The principal addition to the buildings during Maskelyne's directorship was the building of the circle room, in 1808 or 1809, contiguous to and east of the transit room. As has been before mentioned, Troughton's mural-circle was erected in it in the year 1812.

John Pond, who succeeded Maskelyne as Astronomer Royal, was born in 1767. He appears to have imbibed his fondness for astronomical studies from Mr. Wales, at that time mathematical teacher at Christ's Hospital, whom he attended for some time as a private pupil. Mr. Wales had accompanied Capt. Cook in his voyages of discovery, and was well acquainted with the theory and practice of instruments, and to him Mr. Pond, even at that early period of his life, remarked an appearance of discrepancy in the Greenwich observations implying some defect in the instruments, which suspicion was afterwards verified by his own private observations. At sixteen he was entered at Trinity College, Cambridge; and during his academical career Professor Lax was his private tutor. He does not appear, however, to have confined himself to the prescribed studies of the University, and did not derive so much advantage from his opportunities as his mathematical abilities, which were acknowledged to be of a high order, warranted. It is evident, however, that at this period his fondness for astronomy still continued; for he was one of three students who united to induce the Plumian Professor, Mr. Vince, to give a course of lectures on practical astronomy. His health, however, compelled him to go to a warmer climate, and he spent two or three years in the south of France, and in Spain, and afterwards returned to college, where he graduated.

After leaving the University, a second attack of illness obliged him again to go abroad, and he visited in succession Portugal, Turkey, and Egypt. On his return he settled at Westbury, in Somersetshire. At this place he undertook a series of observations with an altitude and azimuth circle, by Troughton (usually known by the name of the Westbury circle), by which he succeeded in proving beyond a doubt, what he had suspected before, that the Greenwich quadrant had changed its form since its erection. These observations, and his discussion of them, are published in the *Phil. Trans.* for 1806; and it may be interesting to add that the celebrated artist, Troughton, afterwards verified the fact of the change of figure of the quadrant, by actual measurement. In 1807, Mr. Pond was elected a Fellow of the Royal Society; and in 1811, on the death of Dr. Maskelyne, he was appointed Astronomer Royal.

Soon after this appointment, in the year 1812, Troughton's mural-circle was erected; and by this means was effected the greatest revolution in the science of observing that had occurred since the time of Bradley. In the present day, the true causes of the superiority of a perfect circle, read by six microscopes, revolving freely on a horizontal axis, and to which a telescope may be firmly fixed in any position, over a fixed quadrant, are well understood; but at that time, the mural-circle, with the usual fate of everything that is new, had to fight its way towards fame; and it was fortunately in the hands of perhaps almost the only man of his time who understood and could avail himself of all its advantages. In the first stages of its use a subsidiary zenith-tube, still existing at the observatory, was used to assist in obtaining its index-error, or zenith or polar point. But in 1825, a second circle, made by Mr. Thomas Jones, intended for the Cape of Good Hope, having been sent to Greenwich for the purpose of being tried and verified, Mr. Pond became so much convinced of the advantage to be derived from the combined use of two circles, that on his representations he was allowed to retain it, and a second instrument was made for the Cape. Mr. Pond's idea of the use of two circles together may perhaps be rendered sufficiently clear to the unscientific reader. Imagine a certain number of stars to be observed on any evening with one instrument by direct vision, and with the other by reflexion in a trough of mercury; on the following evening suppose that the same stars are observed directly with both instruments. The mean of the differences of the second set of observations will give very accurately the difference of the readings of the circles for the same object, or the difference of their index-errors or zenith-points. If this difference, thus found, be applied therefore to the direct readings of the circle which did not observe at all by reflexion, we shall reduce them to the direct readings which would have been found for those objects observed by reflexion with the other circle. We have therefore virtually a series of objects observed directly and by reflexion with the same circle; and it is clear that half the sum of each pair of direct and reflexion readings will give the reading for a point situated in the horizon, called, technically, the "horizontal point;" and the mean will give the horizontal point very accurately, from whence, by the application of 90°, the zenith-point is found. We shall see presently, that the present Astronomer Royal, Mr. Airy, simplified this process, and contrived to observe equally well with one circle. The next great improvement introduced by Mr. Pond was the erection by Troughton, in 1816, of the admirable transit-instrument, which has been used up to the present time, and which replaced an instrument that of its kind was as far inferior to it as the quadrant was to Troughton's mural-circle. This instrument is now in its turn giving place to a gigantic transit-circle*, which will replace at the Royal Observatory both it and the mural-circle, and which we feel confident will win still more conquests from the skies. For the present we will waive more particular descriptions of these instruments, as these will be given with more effect in our walk round the observatory, where we shall see the old yet still valued instruments hung up side by side with those that represent and support the astronomy of the present day; and the old and the new combined will give us, by means of our necessarily tedious historical survey, a very accurate idea of the history of practical astronomy, from its first comparatively rude beginnings under Flamsteed, to its present perfection of mechanical and observing skill. We will briefly mention the other instruments which were erected under Mr. Pond's directorship, all of which have, as it were, passed away, or are preserved only as records of the past, but all of which are nearly allied to the progress of modern astronomy and the fame of the Royal Observatory.

From the time of Flamsteed, one great and natural object of the search of astronomers was the distances of the fixed stars, by means of what is called their annual parallax. Supposing a star to be at not an *infinite* distance from the earth, it is evident that the line drawn from a spectator to the star, at two opposite points of the earth's orbit, or at intervals of half a year, would meet the sphere of the heavens in two different points, or there would be, with regard to the observed position of the star at different periods, a parallactic error. The problem to be solved was to measure this quantity. Dr. Brinkley, by very careful observations with the Dublin circle, thought he had detected measurable parallaxes, amounting to 2″ or 3″, in several of the principal stars, and amongst the rest in α Aquilæ and α Cygni. A friendly controversy originated between him and Mr. Pond on the subject, which was kept up for several years; the Greenwich observations with the mural-circle not confirming the Doctor's results. Still farther to set the matter at rest, Mr. Pond caused two long tubes, furnished with object-glasses and micrometer eye-pieces, to be fixed, one at the back of the pier of the mural-circle, and the other on the quadrant pier; his object being to observe with the one telescope the pair of stars l Pegasi and α Aquilæ, and with the other β Aurigæ and α Cygni, the separate stars of each pair having very nearly the same polar distance. This method of observation was objectionable, because it is possible that separate parts of a tube, or the different parts of the pier to which it is fastened, might shift their relative positions between observations made at intervals of several hours; and in the second place, it is rarely in our capricious climate that two consecutive observations can be obtained. But the method was sufficient to show that no conspicuous parallax existed, and succeeding observations have amply verified all Mr. Pond's conclusions. In 1833 a gigantic zenith tube, 25 ft. in length, was mounted by Troughton, in a small sunk chamber between the dwelling house and the west dome, for the purpose of making observations of γ Draconis and of other stars that pass the meridian near the zenith of Greenwich. This instrument, notwithstanding all the successive improvements of Mr. Pond and his successor Mr. Airy, did not produce better observations than the mural-circle, and its use was finally discontinued in 1848. Before concluding our account of the instruments that were added to the observatory in the time of Mr. Pond, it is necessary to mention that an equatorial, formerly belonging to Sir George Shuckburgh, was presented to the observatory by his executors, in the year 1811, and is known by the name of the Shuckburgh equatorial; it will be described in its proper place.

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* When the above was written, the transit-circle was in course of erection, but at the present time of passing these sheets through the press, it is in full operation, and the transit-instrument and the mural-circle have been dismounted. We shall take advantage of this circumstance to give a description of the observatory as it existed nearly to the present time, and as it exists at present.

Mr. Pond was for several years subject to very painful and harassing complaints; and resigned his office towards the close of the year 1835, being allowed a retiring pension of 600*l.* He died at Blackheath, on September 7, 1836, and was buried at Lee, in Kent, in the same tomb with Halley.

During Mr. Pond's directorship the observatory acquired that organization which it has since retained, and which was necessary to enable it to meet the demand made upon it by the requirements of modern science. On his entrance upon his duties he began, like his predecessors, with one assistant; but on his repeated representations and urgent intreaties for increase of the establishment, he finally obtained six assistants; and this amount of force for the astronomical department of the observatory has been continued, with some modifications, to the present time. Of his assistants, one had been assistant to Dr. Maskelyne, viz., Mr. Thomas Taylor, the First Assistant. Mr. Taylor retired from office at the same time with Mr. Pond.

The improvements introduced by Mr. Pond into the observatory, and the admirable skill which he displayed in the choice of new instruments, and in the use of them after their erection, were not so well understood or appreciated by his contemporaries as they are at present. The same may be said of the laborious fidelity with which his observations, when made, were reduced by the staff of assistants under his direction. His catalogue of 1112 stars was the most valuable contribution of that period to sidereal astronomy, and yields to no modern catalogue in accuracy. His methods and results were explained at intervals in very short memoirs published in the *Philosophical Transactions,* unintelligible to the unscientific reader, and rendered rather repulsive to the astronomer by their brevity. At present, it is well understood that everything done by Mr. Pond was done well, and every step that he took was a step in advance.

Mr. Pond was succeeded in September, 1835, by the present Astronomer Royal, George Biddell Airy, Esq., then Plumian Professor of Astronomy and Experimental Philosophy, and Director of the Observatory in the University of Cambridge. Mr. Taylor was at the same time replaced by the present First Assistant, the Rev. Robert Main, Fellow of Queen's College, Cambridge. One of the assistants, Mr. Frederic Simms, resigned shortly afterwards, and was replaced by Mr. James Glaisher, of the Cambridge Observatory. After this time the most important change in the organization of the establishment occurred in the year 1840, by the addition of the magnetical and meteorological observatory, with an additional staff of three assistants; Mr. Glaisher being transferred to this department with the office of superintendent, and a new assistant being engaged for the astronomical department. After some time it was found that the observing staff of the magnetical department was not numerous enough to bear the fatigue of the unintermitted night observations (observations being made at intervals of two hours throughout the 24 hours); another assistant was withdrawn from the astronomical department. The vacancy thus made was not filled up; but the Astronomer Royal obtained permission to employ additional computers, according to his discretion, or as the pressure of the reduction of the observations might render it necessary.

With regard to the extension of the grounds of the observatory, and the addition of new instruments, it will be sufficient in this place to state that in Mr. Pond's time, the buildings to the east of the circle-room were erected in the year 1813. These included the south-east dome, the old library, and some apartments appropriated to the use of the assistants. In 1820 the zenith tube apartment was erected, connecting the dwelling-house with the north-west dome; and, for the sake of uniformity, the wall was built which connects the dwelling-house with the north-east dome. In 1821 the charge of chronometers was transferred to the Royal Observatory; the room which had been formerly used as the library being appropriated for them, and the room at present used as the library being built. In 1824 a second pier was built in the circle room, for Jones's circle. The magnetic ground, and other parts of the garden exterior to Mr. Pond's boundary, were inclosed in 1837. The magnetic observatory was built in 1837 and 1838. The new south dome, built for the reception of the new altitude and azimuth instrument, was erected in 1844, upon the walls of an ancient part of the establishment known by the name of the "Advanced Building."

The instruments which have been added during the directorship of Mr. Airy, are—

1. The Sheepshanks equatorial instrument, in the south-east dome.
2. The altitude and azimuth instrument, for making extra-meridional observations of the moon.
3. The large transit-circle, very recently completed, and placed in the circle room enlarged and adapted to the purpose*.

We shall be now fully prepared for a walk round the observatory; and our preceding historical sketch will facilitate our explanation of the various buildings and instruments, and of the uses to which the latter are applied.

A visitor on ringing the observatory bell will be answered by the porter,

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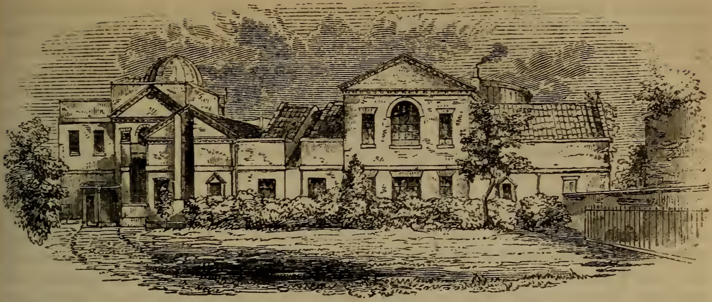
* A room adjoining the transit-circle room is fitted up for a zenith-tube of a new construction, invented by Mr. Airy, to be called the "reflex zenith-tube;" but this instrument is not yet completed.



COURT OF THE OBSERVATORY.

who is usually one of the pensioners of the other remarkable institution of Greenwich, viz., its Hospital for Seamen. A reference to a card kept in the porter's lodge will explain that the privilege of visiting the observatory is of necessity made very limited, those officially privileged being officers of the Royal Navy and gentlemen officially connected with the Admiralty; other visitors are required to be furnished with an introduction from some person of scientific distinction. A scientific foreigner is never refused admittance; and a written application, stating some distinct object, is promptly attended to. It is the desire of the present liberal-minded director of the institution to give every facility to persons who are likely to be benefited by a visit; though he feels that the time of the assistants thus expended is too precious to be spent in attendance upon visitors whose object is simple curiosity.

On emerging from the humble porch inside the gate, the first object that presents itself is the range of low buildings immediately to the left, whose official and as it were sacred character is marked by the rails which fence them off from the more common portions of the court. The old-fashioned, yet rather picturesque gables, and roughly-tiled roofs of these buildings, and their general humble aspect, give no evidence of their use, except what we may gather from the slits, closed by shutters, which in two places intersect them, and the domes that flank them at their eastern and south-western extremities; yet in these unpretending rooms not only are all the observations made which give its fame to the establishment, but the reduction of them is also performed there, and they are rendered fit for the immediate use of the astronomer. But, leaving them for the present, we will cross the court, for the purpose of ascending to the leads above the octagon room or ancient part of the establishment, that we may obtain, before entering minutely on our examination, a bird's-eye view of the whole, as well as of the noble prospect visible from this elevation. The door immediately opposite to us in crossing the court is that of the Astronomer Royal's residence, all the apartments of which are on the ground floor, and situated on either side of a long gallery running nearly east and west. On the wall of the building, a little to the north of this door, is a slab containing the original inscription set up at the erection of the observatory. It is as follows:—

CAROLUS II., Rex Optimus,
Astronomiæ et Nauticæ Artis
Patronus Maximus,
Speculum hanc in utriusque commodum,
Fecit,
Anno Dni. MDCLXXVI., Regni Sui XXVIII.,
Curante JONA MOORE milite,
R.T.S.G.

Beneath this inscription are the circular steps leading to the interior of the octagon room, through which we might ascend, by means of a turret staircase at the western corner of the room, to the roof; but we will, in preference, ascend the exterior staircase, recently erected for general purposes of communication with the roof. On arriving at the summit, the visitor's attention is for an instant diverted from the observatory to the magnificent prospect to which he has been suddenly introduced. Beneath him lies the park, dotted with its gay visitors, and bounded immediately in front by the palace-like central building of the Royal Naval Schools. Beyond this, again, on the immediate banks of the Thames, are the four colossal piles of building forming Greenwich Hospital, which, with its burial-ground, infirmary, schools, and other buildings, occupies the central part of Greenwich. The eye, in looking towards the west, still following the Thames in its course towards London, will catch in succession various private establishments for the building of steamers, or for manufacturing their engines and boilers. Deptford Dockyard, with its colossal building sheds, is an imposing object a little farther on; and as we look still nearer towards London, the eye is bewildered by the countless objects crowded on the river and its banks; storehouses, docks, wharves, forests of masts, form a dense and inseparable mass, till the eye is literally relieved, on a fine day, by the sight of the incomparable building of St. Paul's crowning the whole panorama, and losing, even at this distance, nothing of its magnificence. In this direction also is traced very distinctly the line of the Greenwich Railway, with the other lines having the same London terminus. Towards the south, we look over the well-wooded and undulating surface of parts of Surrey and Kent; the foreground of the picture consisting of the glades and woody recesses of the park, and the view being terminated by the heights in the direction of Bromley.

Shooter's Hill, with its mimic fortress of Severndroog, is a conspicuous object in the south-east, and is of some astronomical importance, as having formed one of the stations of the great trigonometrical survey. Within the inclosure of the observatory, the gardens of the Astronomer Royal, terraced and trimly kept, meet the eye, and point out the boundaries of the small peninsula of level ground on which the observatory stands. The magnetic observatory, near the southern boundary, in the shape of a cross, and glistening white in the sunshine, with its accompanying electrical mast and small observing buildings, is a pretty object at this elevation. In fine, the view presented to us has perhaps scarcely its equal in the world as a combination of picturesque effect with scientific interest and commercial grandeur.

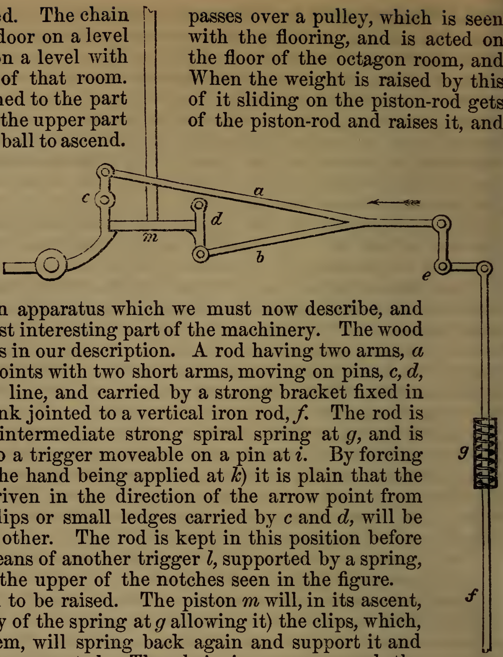
But it is time to begin our survey of the instruments. We will commence with the self-registering anemometer, in the western turret, which, with the pluviometer connected with it, gives, with the smallest possible attention from the assistants of the establishment, complete indications for every instant of the day and night of the direction and force of the wind, and of the quantity of rain which has fallen. This instrument is now comparatively well known, many private observers having erected similar ones. It was erected in 1841, a little after the establishment of the magnetic and meteorological observatory; and has ever since, with a few very trifling interruptions, kept a faithful record of the elements of the weather entrusted to it. A large vane is carried by a hollow tube, which, near its lower end, and above a small table in the turret chamber, carries a toothed wheel. This wheel gives motion to a racked plate, carrying a pencil, which, as it is made to move backwards and forwards by the wind turning the vane, marks a paper stretched on a board beneath it. This board is driven directly by a clock movement, and the hourly spaces traversed by the board are marked on the paper, as are also the spaces at right angles to them, corresponding to the motion of the vane through a whole revolution. Thus the direction of the wind is marked. For the pressure, a plate of metal, 1 ft. in area, is placed beneath the vane at right angles to it; it is supported by horizontal rods, sliding in grooves, and is urged in opposition to the wind by three springs, which come into play successively with the increase of pressure of the wind. A cord from this plate passes over a pulley, and communicates with a copper wire passing through the centre of the spindle, which at the bottom communicates with another cord passing under a pulley, and held in tension by a slight spring, and by this a pencil is moved transversely to the direction in which the paper attached to the board is carried by the clock. This apparatus fails to measure the pressure of light breezes of the wind; and, in fact, does not come into action till the pressure exceeds half a pound.

The anemometer at the top of the small wooden building erected on the roof where we are standing, is the invention of Dr. Whewell, and is intended to measure the velocity of the wind by a self-registering process. A brass plate attached to a vertical spindle, which passes downwards through the axis of a fixed vertical cylinder, bears a vane, which turns it freely according to the direction of the wind. A frame borne upon the plate carries a fly having an endless screw upon its axis, and carries also two toothed wheels, one vertical and the other horizontal. The first wheel is vertical, and works in the endless screw, and has on its axis another endless screw, in which works another wheel that is horizontal. This latter is connected with the top of a great vertical screw, to which is clamped a concave screw carrying a pencil that slowly descends as the screw is turned round, and makes a trace upon the vertical cylinder. The descent of the pencil is measured each day, and gives means of determining the amount of space passed over by the wind. The above description will give a general idea of the instrument, which is now found in several observatories.

The receiving vessel for the rain-gauge connected with Osler's anemometer is just above the turret, and the rain is conveyed to the pluviometer inside by a copper pipe. This vessel is of copper (the first was of glass, but was burst during a severe frost), and is suspended in a frame by spiral springs, which lengthen as the water increases, until nearly a quarter of an inch is collected in the receiver; it then discharges itself by means of the following syphon arrangement. A copper tube, open at both ends, is fixed in the receiver, and over its top a larger tube, closed at the upper end, is placed loosely. These tubes form the legs of a syphon; and when the water in the receiver has risen to the top of the inner tube, it falls through into the uppermost portion of a tumbling bucket, which, turning over, causes an imperfect vacuum in the globe sufficient to cause a draught in the longer leg of the syphon, and the whole contents run off. The ascent and descent of the water-vessel moves a radius-bar carrying a pencil, which makes a trace upon the paper denoting the quantity, violence, &c., of the rain.

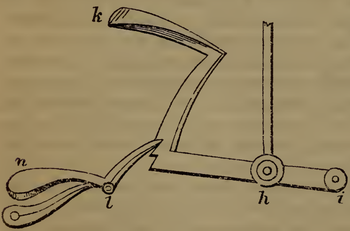
Above the other turret is the time-ball, which is every day raised to the top of the mast, beneath the cross-arms denoting the four cardinal points, and is let fall precisely at one o'clock, P.M., for the purpose of giving correctly the Greenwich time to all who are interested in obtaining it. We will give, in as few words as possible, a description of the machinery by which the ball is raised and let fall.

The ball itself, 5 ft. in diameter, is a frame of wood, covered with leather, and is perforated, to admit of its passage freely up and down the supporting mast. The mast is composed of several pieces of timber joined together, so as to form nearly a square, with a rectangular groove in one side, in which slides a triangular rod of wood, which, passing through the ball, is firmly fastened to it above and below. A piston-rod is connected with this beneath, larger at its upper than at its lower extremity, and terminating in a piston fitted into an air-tube beneath. On two vertical guiding rods close to the piston-rod run the two parts of a weight bored for the purpose, and carrying another part sliding on the piston-rod, and to this weight the chain which raises the ball is attached. The chain passes over a pulley, which is seen on opening the turret door on a level with the flooring, and is acted on by a wheel and axle on a level with the floor of the octagon room, and just outside the door of that room. When the weight is raised by this means, the collar attached to the part of it sliding on the piston-rod gets beneath a projection on the upper part of the piston-rod and raises it, and consequently causes the ball to ascend.



When the rod is raised to such a height that the ball has reached its greatest elevation beneath the cross, the piston is caught by two strong clips connected with an apparatus which we must now describe, and which is, in fact, the most interesting part of the machinery. The wood engravings will assist us in our description. A rod having two arms, *a* and *b*, is connected by joints with two short arms, moving on pins, *c*, *d*, in the same horizontal line, and carried by a strong bracket fixed in the wall. At *e* is a crank jointed to a vertical iron rod, *f*. The rod is in two parts, with an intermediate strong spiral spring at *g*, and is fastened beneath at *h*, to a trigger moveable on a pin at *i*. By forcing this trigger upwards (the hand being applied at *k*) it is plain that the rods *a* and *b* will be driven in the direction of the arrow point from right to left, and the clips or small ledges carried by *c* and *d*, will be made to approach each other. The rod is kept in this position before the ball is raised, by means of another trigger *l*, supported by a spring, which gets inserted on the upper of the notches seen in the figure.

Imagine now the ball to be raised. The piston *m* will, in its ascent, push aside (the elasticity of the spring at *g* allowing it) the clips, which, when it has passed them, will spring back again and support it and the ball with which it is connected. The chain is now unwound, the weight slipping down the piston-rod; the trigger *k* is pulled up (the rod producing a pressure on the spring *g*) till it is caught in the lower notch, and everything is now ready for discharging the apparatus and letting the ball fall.



Near the trigger is placed a mean solar clock, rated every day, and kept a few seconds fast. Opposite this, the assistant charged with the duty of letting fall the ball, stations himself with his thumb upon the plate *n*, and when the hand of the clock has arrived at the proper second, he presses this plate firmly. By this means the trigger *k* is released from the notch; the spring *g* expands and helps the rod in its descent; the rods *a* and *b* are jerked back in the direction contrary to the arrow point; the piston falls (carrying with it the ball) into an air tube, so devised as to ease the shock which would otherwise take place, by the compressing of the air in it. The violence of the fall is regulated by means of a brass cock near the bottom of the air tube.

We will next proceed to the neighbouring building, or the north-east dome, containing the Shuckburgh equatorial. This excellent specimen of Ramsden's work was presented to the observatory by the executors of Sir George Shuckburgh, an eminent astronomer of his day, in 1811, and is elaborately described in the *Philosophical Transactions* for 1793. It was originally intended by Mr. Pond to be mounted as an altitude and azimuth instrument in the south-east dome, but some doubts were entertained of the firmness of the pier, and the idea was abandoned. In this instrument the two pivots of the polar axis are at its extremities, as also the two pivots of the declination-axis. The pivots of the polar axis (9 ft. in length) turn in Ys carried by piers at the opposite extremities of the dome. The north pivot is at the centre of a circular frame, and the south pivot is at the apex of a cone, and the polar frame consists of six pillars connecting the base of the cone with the circular frame. The pillars are united three and three by intervening bars, and carry the Ys for the declination-axis and the microscopes for reading the declination-circle. The diameter of the declination-circle is 4 ft., and is divided to 5′ of arc. The telescope is rather more than 5 ft. in length, and its object-glass is of 4·1 in. aperture. The hour-circle is connected with the cone; its diameter is 4 ft., and it is divided to 4′ of arc;—its divisions are read by fixed microscopes.

Before leaving this instrument it may be well to explain to the unscientific visitor that an equatorial instrument is an instrument capable of following an object in the heavens throughout its diurnal course. In its simplest form imagine an axis capable of revolving freely, to be placed parallel to the earth's axis, and a telescope to be fixed to the middle of it capable of forming any angle with it. Then if the axis be turned round so that the telescope shall be in the plane passing through it and the star, and the telescope be turned on the axis till the star is seen, it is evident that by giving a motion to the axis equal to the earth's diurnal motion, the star will continue in the field of the telescope. If now a graduated circle be attached to the axis in the plane of the telescope, we can observe by proper management the distance of the star from the pole, and if another circle be placed parallel to the earth's equator, we can by proper management observe the angular distance of the star from the meridian, and thus, noting also the sidereal time, obtain its right ascension. But the *legitimate* use of an equatorial is to observe, not these quantities absolutely, but differentially, that is, by comparing objects, such as comets and planets, whose places are required, with stars whose positions are well known.

We will now recross the court and proceed to the principal observing rooms of the establishment, entering by the door of the transit-circle room near the eastern end of the range. In this room were formerly placed the two mural-circles which have been already mentioned, and here they were used from the year 1812 till the year 1848, when, the preparations being commenced for erecting a large transit-circle which is intended to supersede them, Troughton's circle was mounted in a shed erected for it at the eastern end of the library, and Jones's circle was stored away under a shed in the south part of the grounds of the magnetic observatory, where it still remains. At this time* the instruments are in a transition state, the transit-circle being not quite ready for use, and we will therefore take the opportunity to describe them in the usual order, beginning with the transit-instrument, then proceeding to the temporary room occupied by Troughton's circle, and finally returning to the transit-circle room.

The adjoining room†, into which we now enter, is the transit room, and the first object that meets the eye is the admirable instrument which has been in use since the year 1815, mounted on its piers. To the visitor not familiar with the instruments and processes of astronomy, it may be desirable to explain that the transit-instrument is a telescope which is supposed theoretically to describe the plane of the meridian. For this purpose it is furnished with two axes terminating in two well-polished equal cylindrical pivots, and these pivots being placed in bearings sunk in the stone piers shaped like the letter Y (and technically called Ys), the instrument is capable of revolving freely. Due care is taken, in building the piers and in placing the Ys, that the instrument when set up shall be nearly in the plane of the meridian, and it is the business of the astronomers who use it to find out what is the deviation from this plane, and to make the requisite corrections in the calculation of the observations.

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* That is, at the latter end of 1850, as has been before explained.

† The transit-instrument has been since dismounted, and the piers taken down, and the room is being fitted up as the business apartment of the Astronomer Royal.

Now suppose the telescope to turn freely upon a very fine axis (a mere line) which is horizontal, and at right angles to the meridian, then if the object-glass be so placed in its tube that its optical axis shall be also at right angles to this line, it is plain that when the telescope revolves, this optical axis will describe the meridian plane. If then a fine vertical wire be placed in the telescope-tube in the direction of the optical axis, and at the proper focal distance, an object viewed through the eye-piece of the telescope will cross the true meridian when it is seen to come to this wire. Now in practice it is not possible either to make the line joining the centres of the pivots (round which the instrument really revolves) perfectly horizontal or exactly perpendicular to the plane of the meridian; neither is it possible so to place the object-glass in the tube that the optical axis shall be exactly perpendicular to this axis of revolution; neither, in the last place, is it possible so to place the wire that the optical axis shall exactly pass through it. From these circumstances arise three different classes of errors, named respectively the error of collimation, the error of level, and the error of azimuth. The error of collimation arises from the two combined effects of the want of perpendicularity of the optical axis to the axis of revolution and of the want of coincidence of the wire and the optical axis. The error of level arises from the want of horizontality of the axis of revolution. Finally the error of azimuth arises from the circumstance that the optical axis, which now, supposing the above-mentioned errors corrected, describes a great circle passing through the zenith, does not describe the *meridian*, or the great circle passing through the *pole* also. The error of collimation is detected and measured by means of a mark placed at a considerable distance, or by means of a wire placed in the focus of another telescope and viewed through the transit telescope. If this mark or wire be made to coincide with the centre wire for one position of the transit pivots, then, when the instrument is taken out of its Ys and reversed (that is, the eastern pivot placed west and the western pivot placed east), the difference of position of the mark and wire measures in angular space double the error of collimation, and this space is estimated by a micrometer attached to the eye-piece of the telescope. The error of level is determined by the application to the pivots of a large spirit-level, which is seen hanging above the instrument. Finally, the error of azimuth is determined by the transits of Polaris or other stars near the pole, either observed consecutively above and below the pole, or compared with the transits of some southern star, though in the latter case the accurate positions of the stars must be known.

The length of the telescope is about 10 ft., and the aperture of the object-glass 5 in.; the length of the axis is 4 ft. The pivots of the axis are of steel, fixed in 1825, and fresh turned in 1832, and their circular form is sensibly perfect. There are seven fixed wires in the eye-piece, and two wires moveable by a micrometer-screw parallel to the fixed wires. Two fixed horizontal wires serve to define the middle of the field.

The transit-clock* was constructed by Hardy, and was originally furnished with Hardy's escapement. A dead-beat escapement was substituted for this by Dent in 1829. The jewelled holes were removed by Dent in 1836, and the pivots now turn in brass holes.

The skill of the observer is shown in estimating accurately the seconds and tenths of a second at which a star passes each of the seven wires. Having directed the telescope to the object by means of the setting circles at its eye-end, and knowing previously the exact clock time at which the star will be near the first wire, he takes a second from the clock, and then, applying his eye to the telescope, he observes the passage of the star across the wires, noting down the time of passage over each, and not referring to the clock-face again till the transit is complete, when the counting is verified by again looking at it. Bradley did not estimate the fractions of seconds to tenths; this refinement was introduced by Maskelyne, and was an immense improvement, the transits being also taken by him over five wires instead of one.

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* This clock is now used for the observations of the transit-circle, and is placed beneath the pier of the south collimating telescope.

The observer on duty is charged with the observations of all necessary objects that pass the meridian between 3 o'clock on one morning and 3 o'clock on the succeeding, and it frequently happens that his rest is interfered with during nearly the whole of the 24 hours; our clouded atmosphere causes some relief, and without such compulsory rest the labour of observing would be too great for the establishment, well manned as it is.

The transit-instrument answers two distinct purposes. It furnishes absolute time, and it determines the right ascensions of objects observed with it. A certain number of "fundamental" stars have had their places so accurately determined (some of them in the first instance by Maskelyne) that they serve as points of reference whereby to determine, relatively to them, the positions of all other objects. The right ascensions of 100 of these stars are tabulated in the *Nautical Almanac,* and the clock being so set as to show nearly 0h. 0m. 0s. when the first point of Aries (from which right ascensions are measured) passes the meridian, it will show approximately the right ascensions of all objects when they pass the meridian. By comparing then these right ascensions given by the clock, with the right ascensions taken from the *Nautical Almanac,* a "clock error" is given by each object, and the mean of several such objects will give very accurately the error of the clock on "sidereal time," at a given instant, and comparisons of such errors on different days will give the "rate," or the daily sidereal gain or loss of the clock. Then, the position of the mean sun with respect to the equinox being known, as also the ratio of the intervals of mean solar time to the same intervals of sidereal time, if a mean solar clock be compared with the transit clock, its error on mean solar time can be computed. Lastly, the error of the transit clock being thus found by comparison of the observed times of transit with the right ascensions of *known* objects, the right ascensions of unknown objects will be found by applying the clock error back again to their times of transit.

If the visitors have not been wearied with this account of the transit-instrument and its uses, we will, according to our proposal, go back to the humble apartment at present assigned to the mural-circle. It is with no ordinary feelings that the well-read astronomical student pays a visit to this instrument. As before explained, with its erection in 1812 commenced a new epoch in practical astronomy, and little additional accuracy worth mentioning has been obtained since that time. It consists, as you see, of a circle 6 ft. in diameter, with graduations to five minutes of space performed on a band of platinum let into its rim, and revolving on an axis having its bearings in a hollow metal cone let into the wall. Six microscopes are fixed firmly on blocks let into the wall at sensibly equal distances round the circle, and all of these are read for every observation. By the mean of these readings, a reading is obtained which is not only independent of false centering, but of almost any small casual inaccuracies in the graduations. The telescope is firmly clamped to the outer rim of the circle both at the eye-end and the object-end, and it has been the practice to give it a different position on the limb at the beginning of every year, for the sake of avoiding any errors of a constant character which might affect the observations. The diameter of the object-glass of the telescope is 4 in. Its eye-piece contains five vertical fixed wires and one horizontal wire moveable by a micrometer. The use of the five wires, one of which marks approximately the meridian, is for the purpose of repeating the observation of the moon, and by this means giving every possible accuracy to the observations of this important luminary. Thus far the visitor will understand that the mural-circle observes differences of zenith distances or polar distances, but by an ingenious contrivance it is made to observe absolute zenith distances. On descending into the pit used chiefly for reading the lower microscopes, and removing the cover from a box standing beneath the circle, it will be perceived that this contains a quantity of mercury, and this mercury is capable of being placed in any position necessary for reflecting the rays of light coming from any object, from its surface back again into the tube of the telescope previously placed in a proper position to receive them. Now the observer has for his use a catalogue of stars, containing, besides the approximate readings of the circle for observation by direct vision, the readings of a certain number for observations by reflexion. He then by this means directs his telescope properly for the reflexion-observation a few minutes before the transit of a suitable star, clamps the circle, reads the microscopes, and arranges his mercury trough; then, ascending the stage, and quietly watching the image of the star till it comes near the central vertical wire, he bisects it with the horizontal wire by turning the micrometer-screw, and running rapidly down the northern steps of the stage, he unclamps the circle and directs it towards the star as seen in the heavens (carrying in his mind the circle-reading for direct vision). Reclamping the circle he again brings the star upon the wire by the use of the slow-motion screw of the clamp, and finally reads the circle microscopes and the telescope-micrometer. He has thus two complete observations of the same object, one for a position a certain number of degrees below the horizon, and the other for the same number above the horizon. It is plain, therefore, that the mean (or half the sum) of these readings will be the reading for an object in the horizon, and this diminished by 90° will be the reading for an object in the zenith, technically called the "zenith-point." By such observations the zenith-point is accurately determined, and this being applied to the circle-readings for all other objects observed, gives apparent zenith distances. This beautiful use of the mural-circle was first introduced by the Astronomer Royal while he was director of the Observatory of Cambridge. If now a certain number of stars near the pole have their zenith distances accurately determined for both the upper and lower transits, it is plain that the colatitude can be accurately determined, and thus the observed zenith distances can be converted into north polar distances.

As time will not permit of a longer gossip over this interesting instrument, we will turn back again, and proceed to visit the east dome, containing the Sheepshanks' equatorial. Proceeding up the narrow and rather steep staircase, past the chronometer-room and library (which we will visit on our return), we enter the dome from the leads of the eastern buildings. The dome itself, which has an opening closed by curved shutters sliding upwards and downwards, moves with sufficient ease by means of a toothed wheel and rack, the manual power being applied at the ends of long radial bars. It turns on fixed wheels, and not, as the other dome, on shot. The instrument was erected in the year 1838, the mounting being made by Mr. T. Grubb, of Dublin. The object-glass, whose definition is very good, was made by M. Cauchoix, of Paris, and was presented to the observatory by the Rev. R. Sheepshanks. It is nearly 7 clear inches in diameter, and of 8 ft. focal length. The mounting is that usually known by the name of the Fraunhofer mounting, the telescope being on one side of the axis, and counterpoised by weights on the other side. The hour-circle and declination-circle are small, and only used, in general, for setting the instrument. Above the upper bearing of the polar axis is fixed a square box, perforated for the declination-axis, and upon a ring on this box another ring turns with stiff friction, carrying two sector arms, graduated at their extremities, and read by micrometer-microscopes. This gives the means of determining differences of declination, amounting to some degrees, with tolerable accuracy. Clock-work is attached to the instrument, for the purpose of giving to the telescope a motion equal to the diurnal motion. To effect the attachment of the clock, two circular plates are placed near together on the polar axis, near its upper extremity; the lower being immoveably fixed to the axis, but the upper one turning freely. These plates are capable of being clamped firmly together, so that if the polar axis moves it shall carry with it the upper, or moveable plate, as well as the lower one. The moveable plate is inseparably connected with a long flat sector in the plane of the equator, whose edge is cut in teeth, in which works the endless screw carried by the clock. The speed of the clock is regulated by two balls, suspended to the end of a horizontal arm, which is carried by a vertical spindle. When the velocity is so great as to cause the suspending rods to make a certain angle with the vertical, small projections carried by the balls are thereby made to rub against the lower surface of a fixed horizontal ring, and the friction thus caused prevents the weight which urges the clock from increasing the velocity.

The chief use made of this instrument has been in the observations of comets, and in the measurement of double stars. The latter class of observations is made with a double image micrometer, invented by Mr. Airy, which is capable of measuring small distances with very great accuracy. With this micrometer the shapes of the planets Mars, Jupiter, and Saturn, have been very accurately determined; and the latter has been proved to be perfectly spheroidal in form, contrary to the opinion of former astronomers. The interesting binary star, γ Virginis, whose components are now, in their revolution round each other, again separating, is measured with great care every year; and other observations of a similar character are made as occasion requires.

In going down from this instrument we will step into the chronometer-room, in which are kept and rated chronometers belonging to the Government, required for the use of ships. The business relating to the purchase and repairs of all government chronometers passes through the hands of the Astronomer Royal; and this includes the severe trial, in extreme temperatures, of a certain number sent by the makers at the beginning of each year; the Admiralty purchasing in the autumn (after the extreme summer heat is over) a small number of those most highly recommended to them. The management of these chronometers (the number of which has at times amounted to 170) occupies a considerable portion of the time of two assistants, who are charged with the duty of winding them daily, and comparing them with the clock placed in the room for that purpose. Between 12 and 1 o'clock, the junior of these assistants goes round the observatory with a small chronometer, called a "click," which is capable of being set going accurately in coincidence with the transit-clock; and by its help he compares the ball-clock, the chronometer-clock, and such others as are required, with the transit-clock. Having thus obtained by calculation the errors of these clocks from mean solar time (the error of the transit-clock being determined by stars observed generally during the previous evening), he and his colleague proceed to raise and drop the signal ball, raising it five minutes before 1 o'clock, and dropping it precisely at 1, as has been explained. They then proceed to the chronometer-room, where one person, opening the lids of the boxes, begins to wind the chronometers; and the other, following at a short interval, examines them, to ascertain that they are properly wound, and then closes the lids. When the winding is completed, one assistant takes his seat at a table where is the blank form book for entering the comparisons of the chronometers, and proceeds to write down the numbers called out by the other who is making the comparisons. The latter, lifting the lid of each chronometer, and counting the clock-beats, gives for each the clock-seconds corresponding to 0 seconds of the chronometer, making each time the requisite mental calculation, and these are the numbers written down by his companion. The rapidity with which this is done would surprise the uninitiated; the clock-second being caught, the corresponding seconds and tenths corresponding to the seconds of the chronometer being estimated, and the mental reduction to 0s of chronometer being performed, in ordinary cases, in the space of a very few seconds of time. When all are compared that are intended to be compared, the assistants change places, and the comparisons are repeated, so that any error which may have been committed in the first comparison is almost infallibly corrected. The chronometers on trial for purchase are subject to a severer ordeal than the others. As soon as they are received (early in January), they are, if the weather be severe, exposed to the open air, outside the north window near the chronometer-room, being placed under a penthouse, protected by a grating. After a little time they are suddenly exposed to a trial of extreme heat, either by being placed in a tray placed above a large stove, which raises their temperature to about 100°, as was formerly the practice, or by placing them in an apparatus heated by gas, as is the practice at present. The object of this trial is to ascertain whether the compensation of their balances is perfect; and the length of trial to which they are subject is to detect the irregularities which would result from inferior workmanship or springs not properly tempered. The duties of the chronometer-department are necessarily heavy; and it should be borne in mind that the time occupied in it, though unquestionably well bestowed for the public service, and on a subject most intimately connected with nautical astronomy, is withdrawn from the usual duties of the astronomer, and partly occupied with a good deal of clerk-like business with which astronomy has nothing to do*.

The adjoining apartment, into which we now enter, is the library, well furnished with books of all classes interesting or useful to the astronomer. Ephemerides and almanacs of all nations; the transactions of all the learned societies in Europe and America; the most elaborate treatises on astronomy, and every kindred subject, ancient and modern; tables of every kind; important star-catalogues, from the earliest astronomical periods to the present time; such are the kinds of books that line the shelves of this collection. And it is interesting to add that the members of the establishment are all fully aware of the advantage which they possess in the privilege of using at their discretion such a library, and that they avail themselves of it freely and constantly, to their own great advantage and that of the institution to which they belong.

We will now proceed back again to the transit-circle room, and take a view of the magnificent instrument which, perhaps, will play a very conspicuous part in the future history of astronomy. The great object which the Astronomer Royal had in view in its erection was solidity and firmness; and, to accomplish this, the separate parts of the instrument are few in number, and as much as possible was cast in one flow of metal. The central part of the instrument is a large hollow cube, of 20 inches, cast in two parts, which are united by several nutted bolts passing through flanges with planed parallel surfaces. Each pivot was cast in the same piece with its corresponding part of the cube, and was afterwards hardened by a very ingenious chilling pro-

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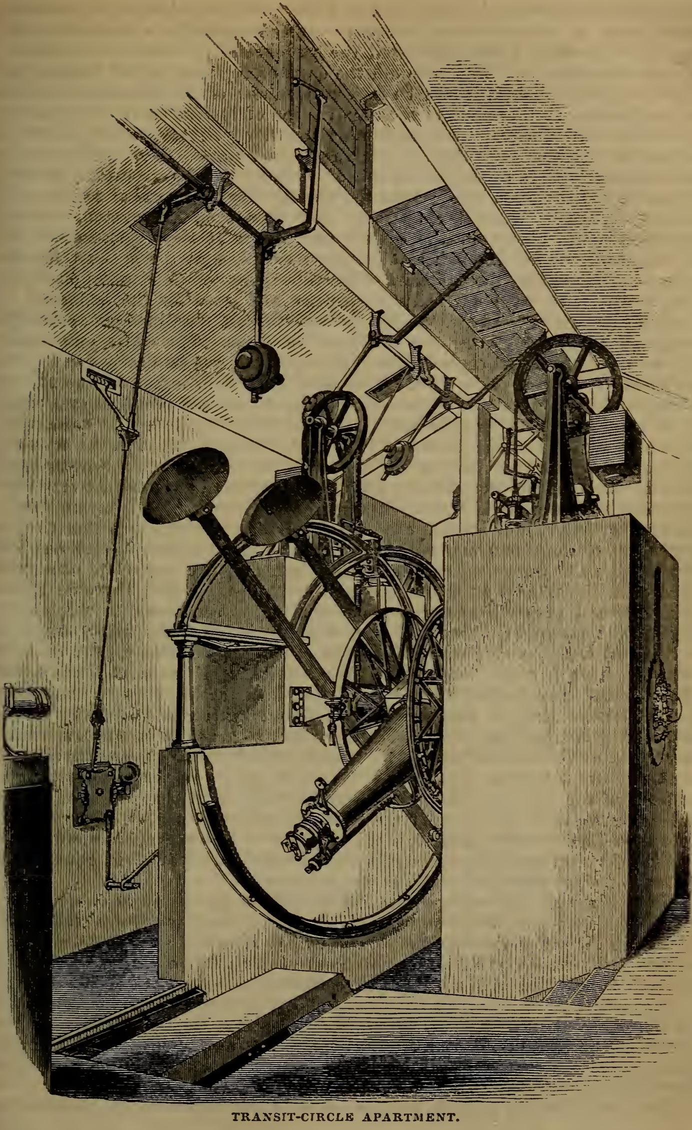
* Since the above was written, the chronometers have been transferred to a room prepared for them above the computing-room, the room in which they were formerly placed being intended to form an addition to the library.



TRANSIT-CIRCLE APARTMENT.

cess, so as to be nearly as hard as the finest tempered steel. The hardened surfaces extend to a depth of about a quarter of an inch. The process of giving to the pivots their circular form, and of finally polishing them and rendering them equal in diameter, was, as may be easily imagined, a very troublesome one, and one which nearly exhausted the patience of the eminent engineers, Messrs. Ransomes and May, who did the engineering part for the instrument. Now it is accomplished, it may be reckoned as one of the greatest triumphs of engineering skill applied to the construction of instruments. Though the pivots are still unequal by a measurable quantity, yet that quantity does not exceed the thickness of a sheet of the finest tissue paper. The telescope-tube, which is nearly 12 ft. in length, consists of two huge cones, each cast in one flow of metal, and these are bolted upon the central cube by means of flanges with planed surfaces. When the telescope had been thus far erected, a small object-glass was placed in the centre, and a wire at the object-end of the telescope was viewed through a micrometer eye-piece at the eye-end, for the purpose of measuring the deflexion of the tube in opposite horizontal positions. The experiments were uniformly consistent, and gave for the deflexion, or drop of each end of the tube, the one-thousandth part of an inch, an amazingly small quantity considering the weight of the tube. The cones weigh each 1¾ cwt. nearly; and the central cube, with its pivots, weighs nearly 8 cwt. The diameter of each pivot is about 6 in., and the whole length of the axis is about 6 ft. The diameter of the object-glass, which is a very fine one, made by Simms, is 8 in.; so that the optical power of the telescope will be quite equal to the observation of the faintest objects that will be required in the course of ordinary meridian observations. It was found that the 10 ft. transit-instrument and the mural-circle were scarcely adequate to the observation of the very faint asteroids, so many of which have been recently discovered, and that an instrument of greater power was imperatively required. In addition to this, the observations of the moon made with the altitude and azimuth-instrument had proved that the transit-instrument, though probably the best of its class, and used with the utmost skill, was comparatively unstable, and that the errors arising from its defective determination of absolute time were far more to be feared than any other. Two circles, of 6 ft. in diameter, are firmly fixed on cylindrical bands, one on each side of the central cube. The eastern circle is used for clamping; and the other is graduated like the mural-circle, except that the graduations are performed on a bevelled or dished surface edge, and will serve for the observations of zenith distance. This latter circle is read by means of six long microscopes, about 45 in. in length, whose eye-pieces are arranged in a circle at the back of this pier of about 2 ft. in diameter, and having its centre about 5 ft. from the floor. The object-glasses of the microscopes are in front of the pier; and their optical axes, which lie in the surface of a cone diverging towards the front of the pier, are of course nearly perpendicular to the graduated or bevelled edge of the circle*. For convenience, the heads of the micrometers of the microscopes are divided into a hundred equal parts, instead of sixty parts, as is usually the practice.

Besides the six microscopes for the reading of the circle in the ordinary course of observation, five others are added, having their eye-pieces and object-glasses in the same circles as the others, to give means of testing the accuracy of the divisions. For testing the accuracy of the relative form of the pivots, the axis is provided with a collimator, consisting of a lens of 6 ft. focal length in the perforated or illuminating pivot, and a tube with a small perforated disk in the other pivot. A lamp being placed behind the perforated disk, the image of the spot of light is viewed through a telescope of 7 ft. focal length, placed opposite to the axis, and micrometrical measures are made of it at short intervals through a whole revolution of the pivots.

The circle has its degrees so marked as to read approximately zenith distances of objects observed; while a pointer, fixed to a block projecting from the lower part of the pier, points to another graduated band on the outer or eastern side of the circle, used for setting the telescope, and gives approximately north polar distances. A small finder, with a large field of view, is attached to the telescope-tube; and also a sighting apparatus, for directing the telescope to stars by the naked eye.

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* The surface on which the divisions are cut is, in fact, at any point normal to the line bisecting the angle formed by the optical axis of any one of the microscopes, and the axis of the corresponding illuminating hole.

For illuminating the field of the telescope and the graduated band of the circle, a large gas light is used at the back of the western pier, on a level with the centre of the perforated axis, and this throws light at the same time through a lens into the telescope, and on lenses placed in large holes lying in another conical surface, cut through the pier in the direction of the circle. The light thrown into the telescope is received upon a perforated reflector, capable of being placed at any angle of inclination with the tube of the telescope, and by this means the light in the field of view is moderated.

For the illumination of the wires in the observation of very faint objects with the field of view perfectly dark, eight prisms are employed. Four of these are arranged symmetrically on the surface of the reflector, and four others are fixed in the eye-piece tube in corresponding positions, nearly in the plane of the wires. By pushing the rod that acts upon this reflector, and making its position perpendicular to the tube of the telescope, the field of view is rendered dark, while the light reflected from the four prisms on the reflector is thrown down the tube upon the other prisms, and then reflected by them across the field, so as to illuminate the wires on both sides. The tube has galvanic wires attached to it, with the object of ultimately observing transits according to the American method of self-registration. The eye-piece is furnished at present with seven fixed vertical or transit wires, moveable by a micrometer, and with one horizontal wire, moveable by a micrometer. The error of collimation is obtained by means of two collimating telescopes placed on piers north and south of the instrument, as it is impracticable to obtain it by reversing the instrument. The error of level is determined by observing with an eye-piece with three lenses, furnished with a reflector, the relative situations of the central wire, and of its image reflected from a surface of mercury. The error of azimuth is found in the usual way by transits of circumpolar stars.

The examination of the instrument in collimation being effected by the use of two telescopes placed on piers north and south of the instrument, it is necessary that it should be occasionally lifted from its Ys, for the purpose of previously adjusting one of these upon the other, each in turn serving as collimator to the other.

This is effected in the following manner:—

Two large stirrup-forks are so placed that they can, by a slight elevation, come in contact with the lower sides of the axes of the instrument near its two pivots, and that, by further elevation, they can raise it to any desired height. These forks are suspended by long screw-stalks, which are raised by nuts whose support is upon fixed plates above. The upper side of each nut is a bevelled wheel, in which act other bevelled wheels whose axes are horizontal. A spindle connects the axes of the opposite wheels when the instrument is to be raised, and the raising is effected by turning this connecting spindle. The strain upon the threads of the screw is very nearly relieved by counterpoises acting by chains over large pulleys.

The same screw-rods which carry the stirrup-forks, also carry the fulcra of the ordinary counterpoises, by which means the instrument is in almost exactly the same state (as regards strain) when it is raised, as when it is in use, as is also the pressure upon the screw stalk; so that if counterbalanced for one state, it is nearly counterbalanced for the other, and the effort required for raising or lowering it is extremely small.

As observing by reflexion will be a very important feature in the use of the instrument, it was necessary to provide means for carrying the mercury trough conveniently and safely, and also to prevent as much as possible any disturbance of the mercury.

The frame carrying the mercury trough is itself carried by two bars moving freely on pins fixed in the eastern pier in the same horizontal line. The length of each bar is about 16 ft. from the upper to the lower extremity, and 8 ft. from the pivot to the lower extremity, leaving just sufficient room for the trough to pass freely above the floor of the pit. Their upper extremities carry counterpoises, so that in use the trough rests in equilibrium in any position. A large iron semicircle, of rather more than 6 ft. radius, is fixed to the face of the pier, with its surface projecting beyond, and its centre on the same level as the pins, and is rabbeted above and below. To this semicircle is attached a clamping-piece, carried by a horizontal bar, whose length is equal to the distance between the pivots, viz., 3 ft. 6 in., and connected with the bars by loose joints. By this means the bars can be clamped fast in any position.

Two pieces project from the bars at their lower extremities in a direction perpendicular to the face of the pier, and these carry two spindles in the same horizontal plane. To the ends of the western spindle, which revolves freely, arms are attached, which take hold of the mercury trough at its upper western edges, turning freely on cylindrical pins, and whose other ends are firmly attached to the ends of a large cylindrical counterpoise through which the spindle passes. The projecting pieces carry also vertical supports for two other moveable arms beneath the former, which are attached to the middle of the mercury trough and beneath it. The difference of height of the centres of these arms carrying the trough is equal exactly to the difference of height of their points of attachment to the trough, and their lengths are exactly equal from the centres to the points of attachment. Provision is thus made for giving a motion to the trough in the east and west direction, so that its level shall not be disturbed; and it can with great ease be put into its position for use, or put on one side out of the way.

The shutters of the room are 3 ft. in width, and are opened in six pieces. Two of these are vertical, and are opened or shut with great ease by a simple combination of levers. The other four pieces are horizontal, occupying the ridge of the roof, and are each opened and closed by a combination of levers acted on by a winch moving a rack and pinion. The weights of the shutters are relieved by counterpoises. At their junctions they are protected by small overlapping shutters, and keep out the rain most effectually.

The next instrument which we will visit is the altitude and azimuth-instrument, which was erected, as has been mentioned, for extra-meridional observations of the moon. Our direct road will be through the computing-room, and we will exercise our editorial privileges by pausing for a few minutes, and speculating on the busy scene presented to us. Seated at desks and tables in different parts of the room are the Astronomer Royal and the six subordinates permanently attached to the establishment, besides one or two persons engaged as computers to assist in the labour of reducing the observations. By looking a little more minutely we shall observe something of the nature and order of their several employments. The Astronomer Royal's table is covered with letters and documents, denoting an extensive correspondence and a great deal of miscellaneous business; while maps, drawings, plans, models, &c., vouch for the varied nature of the scientific employment of his never-resting mind. Above one table are several ponderous manuscript books, arranged on a shelf labelled "Transit Observations;" and we may infer that the persons sitting at this table are mainly engaged in the task of this department. Another shelf bears the label, "Circle Observations," and "Altitude and Azimuth Observations;" and row after row of gigantic folios vouch for the industry of the other persons similarly employed in these departments. On looking over the shoulder of one computer, we find that he is employed upon a book of blank forms, that is, of printed forms where every operation to be performed is indicated so plainly that scarcely a possibility of mistake or error can arise. It is the practice to reduce considerable masses of the same class of computation at the same time, so that the computer laboriously makes his way through line after line of his work till he arrives at the bottom of his pages, when his work is complete, and he passes it on to another person for examination. But his duty is never-ending; a new set of computations, involving the same monotonous labour, is awaiting him, and new observations are continually supplying the places of those which have been reduced. Some idea of the aggregate amount of labour performed may be formed by the fact that the various blank forms for calculation amount to considerably above 100.

While some observations are being reduced, others that have been reduced and put into the printer's hands, are being passed through the press—a most wearying and thankless labour. To insure every possible accuracy to this process, two assistants are employed to compare figure by figure the printed sheet with the original computations, one person reading from the MS., and the other holding the sheet, and being answerable for every figure requiring correction. After this process it is passed over to the First Assistant, who gives it a systematic examination in the way which his experience suggests as best adapted to detect any errors which may yet (and some such will infallibly) remain. If the Astronomer Royal be present the sheet is finally passed to him, and he examines such parts as are most liable to error, and is frequently successful, even at this stage, in finding something still wrong. In addition to these astronomical labours, a report on the rates of the chronometers is required to be sent weekly to the Admiralty, and a good deal of business relative to their repairs is to be transacted with the makers.

A large paper placed upon a board above the mantelpiece contains the arrangement of the assistants for the observing duty for the week. Each observer's watch extends from 3 o'clock on one morning till the same hour on the following; and the duties are, for the meridian instruments, to observe on the meridian the sun, the moon, and every planet which is visible during this interval, together with a list of stars furnished to him, and limited to a certain hour of the night; for the altitude and azimuth-instrument the observer must watch the moon from the time of her rising to her setting, till he has obtained a satisfactory observation in both elements, and in cloudy weather this duty is very harassing and fatiguing. A chronometer placed in a conspicuous part of the room warns the observer during the computing hours when the passage of a planet or a bright star is about to take place; and at such times the meridian observers for the day quietly leave the room, and, when they have completed their observations, as quietly resume their computing labours. In fact, what strikes a visitor most on a casual inspection is the quiet, and order, and regularity, with which everything is done. Every one knows precisely what his duty is, and how to perform it well. Every possible help is made use of for shortening the processes of calculation, and among other methods for this purpose great use is made of sliding scales, which have been adapted by the Astronomer Royal for many processes which would without them be very tedious and troublesome. All the best modern tables are at hand also to ease the computer, and the economy of labour is carried to its greatest possible extent in every operation that is to be performed.

Leaving the computing-room by its western door we find ourselves in a passage or thoroughfare that was formerly part of the quadrant-room of the observatory. The quadrant immediately opposite to us is that which was made by Bird for Bradley, of which an account has already been given in our history. To see Graham's quadrant we must go into the room on the other side of the pier, which has been rendered fire-proof by means of building up the wall above the pier, so as completely to isolate it from the other parts of the building, and by making its door, shelves, and other furniture, of iron. In this room are stored all the MSS. of the observatory, from the time of Flamsteed to the present time. Flamsteed's MSS. were collected and arranged by the late Mr. Francis Baily, and they formed the principal materials from which his valuable life of Flamsteed was compiled. They are neatly and strongly done up in cases and guard-books, so that their existence and durability are secured for a long period of time. The MSS. of Halley and Maskelyne follow, and the fac-simile copy of Bradley's observations, generously allowed to Mr. Airy by the University of Oxford, in whose keeping are the original MSS. In a larger chest lie the papers of the Board of Longitude, classified according to their subjects, yet not finally arranged or reduced to order. The proceedings of this Board form a most important part of the history of astronomy; and an account of its proceedings would form one of its most interesting chapters. Amongst those papers lie buried the wild schemes of the needy and ignorant pretenders to science, some of whom identified the finding of the longitude with the squaring of the circle, and both as problems to be accomplished by some sleight of hand, with which science had little to do. The Board of Longitude accomplished its object by exciting industry and skill in two very distinct departments, viz. by the perfection given to chronometers, and by improved tables of the moon, which were elicited by the prospect of the same reward; but the inspection of the papers generally gives a melancholy view of misapplied energy and talent.

Amongst the voluminous books and papers of the present Astronomer Royal, arranged with a precision of order perhaps unequalled, we may select a few of the most prominent for a cursory inspection. Those thick and labelled folios over the door contain the MSS. of the computations of the recent Greenwich catalogues of stars, a most valuable contribution to science; and the size and number of these volumes will give some idea of the labour of such a work. In another part of the room are other large folios, containing the computations connected with the chronometrical expedition for the determination of the longitude of Valentia, on the north coast of Ireland. All the computation-books for the reduction of the meridian and other observations are ranged in order on the shelves, and present rather a formidable idea of the heavy and monotonous labours of the computing-room. In fact, we could say now with perfect confidence of the contents of this room what was said nearly half a century ago of the Greenwich observations by Delambre, that, if the whole edifice of astronomy were by any series of casualties to be destroyed, it might be rebuilt by the materials found here. The room is already shelved round in every possible way, but the accumulation of books and papers is so rapid under the present vigorous administration of the observatory, as to be rapidly becoming too small for its object.

The *Altitude and Azimuth-Instrument** in the *New South Dome*, to which we now proceed, passing through the quadrant-room, is the last astronomical instrument which claims our notice. The dome is erected on the site of what was formerly called the advanced building where Flamsteed's mural-arc stood. The staircase by which we ascend is carried round the three-rayed brick pier which serves as the foundation of the instrument. Upon the three rays of the pier are laid the radial arms of an iron triangle, which is the basis of the support of the upper pivot of the instrument, and upon its centre is placed a smaller pier that supports the fixed circle in which turns the lower part of the instrument. An upper triangle, having its angular points in positions corresponding to the sides of the lower triangle, and connected with it by iron bars screwed to the triangles, forms the remaining part of the frame for the support of the upper pivot. This part of the construction it is necessary to explain in

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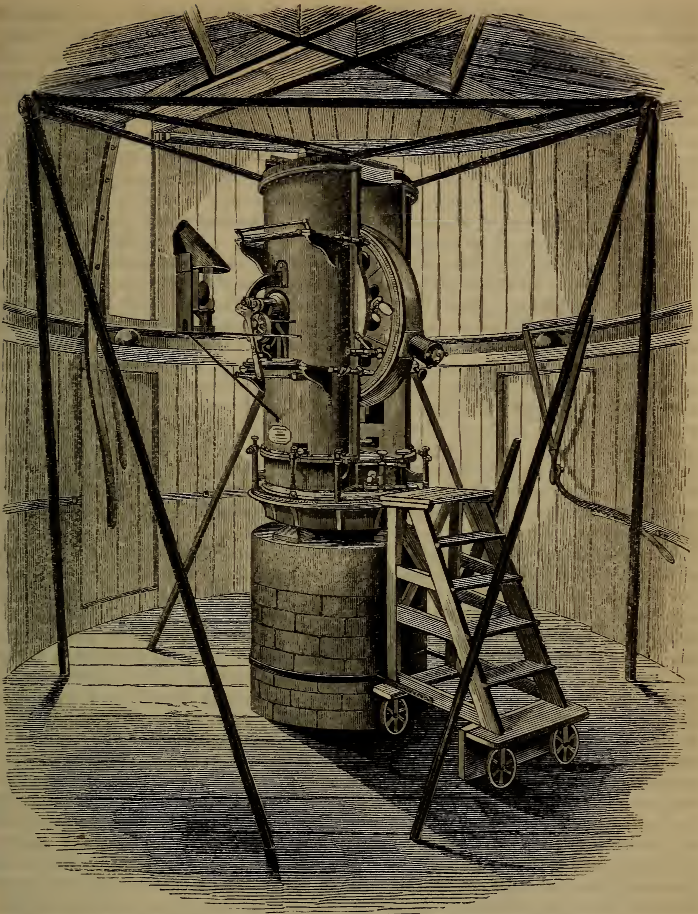
* This instrument is now called, in compliance with a suggestion of Dr. Whewell, the "Altazimuth Instrument."



THE ALTAZIMUTH INSTRUMENT.

our passage up the stairs; but it will be desirable before entering on any other details to explain the objects which the Astronomer Royal had in view in erecting this instrument, and in adopting this peculiar construction. The observatory was originally founded for observations necessary to bring to perfection the lunar tables, and for the improvement of nautical astronomy. The observation of the moon in every part of her orbit has always been, therefore, an object of first-rate importance. To effect this, meridian observations have been always employed in fixed observatories as alone giving results of the requisite excellence. But, since the moon is invisible at her meridian passage for nearly one-third of her orbit, viz. for about 4 days on the average before conjunction, and for 4 days after it, and since also a great many observations in each lunation are necessarily lost by cloudy weather, it became a great desideratum to supply, if possible, by extra-meridional observations, these defects. The altitude and azimuthal instrument was evidently the kind of instrument that must be employed for this purpose, because, its axes being one horizontal and the other vertical, the parts of the instrument are equally affected by gravity in every position, and the only thing wanted to produce observations which should rival those made with the transit-instrument and mural-circle, would be sufficient firmness. To effect this the Astronomer Royal adopted as his principles of construction, "to form as many parts as possible in one cast of metal, to use no small screws in the union of parts, and to have no power of adjustment in any." The instrument is therefore, as the visitor may see, of unusual weight and solidity. One of the two vertical cheeks that are on each side of the telescope carries in one cast of metal the four microscopes for reading the vertical circle and the supports of the levels parallel to the plane of that circle. The lower piece connecting these cheeks, or the base plate, carries in one cast the four microscopes for reading the horizontal or azimuthal circle, and supports two levels parallel to the horizontal axis; and the upper connecting piece carries two other levels similarly situated and the upper pivot. These pieces are most firmly connected with the side vertical cheeks by means of planed surfaces and screw bolts. The vertical circle was made in two casts of metal; viz. the cylindrical part, the spokes and pivots on one side, the object-end and the eye-end of the telescope were made in one cast; and in the other cast are included the spokes and pivot on the other side. Thus the whole of the essential parts of the instrument with regard to firmness were made in six casts of metal. The weight of these six parts is about 16 cwt.

The instrument thus massively constructed turns upon a lower fixed circle strongly ribbed beneath, and supported by three of its ribs resting in grooves cut in three metallic blocks let into the pier. The lower pivot (of gun metal) upon which the azimuthal frame revolves is spherical, and takes its bearing upwards in a socket in the baseplate, and downwards in a cone of harder gun metal in the lower fixed circle. Part of the weight of the instrument is taken off from the pivot by a counterpoise acting by means of levers that push a slider upwards against the pivot. The upper pivot is held in a Y kept in a fixed position by means of a frame of three radial bars that are welded together at the centre, and whose extremities, cut into screws, rest in forks cut in the upper iron triangle previously described, an outer and an inner nut being applied to each, which firmly embrace the fork and prevent the rod from sliding endways in it. A moderately slow motion is given both in altitude and in azimuth, the inner portions of the vertical and horizontal circles being racked, by means of pinions working in the rack; but there is no provision by means of screws for a very slow motion. The pivots of the vertical circle were severely tested by microscopes fixed opposite to the ends of them, which were made to observe the horizontal and vertical coordinates of a dot in each pivot in different positions of the vertical circle. The result of the examination was most creditable to the skill of the engineers, Messrs. Ransomes and May, the errors of form of the pivots being so small as to require no numerical correction. The division of the two circles was performed by Mr. Simms with his dividing engine, and was proved after a severe examination to be nearly perfect.

A large gas-light, carried by one cheek (the gas being conveyed to it by jointed tubes, which accommodate their position to the rotation of the instrument), and placed opposite to the perforated pivot, illuminates, by means of a series of reflectors, the four microscopes of both circles, and at the same time throws light into the field of the telescope. It is worth while to mention with regard to the microscopes, that they are surrounded with long tubes of brass coated internally with plaster, which reach very nearly to the divided limbs, a hole being left for the admission of light; and that their reflectors are also coated with plaster. The effect of this construction (borrowed from the Germans) is that the divisions are seen as dark strokes upon a light ground, without any appearance of specular reflexion, and without any bright lines at their edges.

For the purpose of keeping a check on the constancy of the zero of azimuth as observed by stars, and for observation of the zero of altitude, a collimator or fixed mark is employed, consisting of a lens of long focus fixed in the north side of the dome, and of a tube firmly fixed in the upper part of the building to the north of the dome outside the computing-room. This tube carries a disk of metal with a very minute perforation, behind which is placed a gas-light, and, the telescope being directed to it, the appearance is that of a well-defined brightish star admitting of very accurate observation.

We will devote but few words to the explanation of the methods of making the observation before leaving the instrument. If the observation be that of the azimuth of the moon's limb, the azimuthal circle is clamped before the limb comes to the first of the six vertical wires, and, as she passes obliquely through the field, the transit of the limb is taken as nearly as possible on the same part of each wire by giving motion to the vertical circle, and, when the transit is complete, the microscopes of the horizontal circle, and the four levels parallel to the axis of the vertical circle, are read. A similar explanation will apply to the observation in altitude.

The observations made with this noble instrument have fully answered the expectations of the Astronomer Royal, both in quantity and excellence. During the last year the observations were at least double in number of those made with the meridian instruments, and of equal goodness. Some also were made within one day of the moon's conjunction; and we may confidently expect that a few years' observations with the instrument will, as nearly as is possible, bring to perfection the theory of the moon, and annihilate the remaining errors of her orbit.

We have still to visit the *Magnetic Observatory,* and therefore must omit many details respecting the altitude and azimuth instrument, for which we must refer the scientific visitor to the introduction to the Greenwich Astronomical Observations for 1847.

Magnetism is a subject closely allied to nautical astronomy, and its elements have been the subject of observation since the beginning of the seventeenth century, though it is only within a very few years that a great organized effort has been made for collecting sufficient facts for determining the magnetic condition of the various points of the earth's surface, and for rendering the knowledge thus acquired subservient to the improvement of navigation.

For the modern theory of magnetism, and for the invention of the chief instruments employed in modern research, we are indebted to the great German philosopher Gauss, as well as for the idea of the organized corporation of different countries for determining simultaneously the various required elements within their respective boundaries. England, though not taking the lead in this movement, has yet answered nobly to the appeal made to her, and to the observations made at her head quarters of science, Greenwich, and to those made in her colonies, the future philosopher will perhaps mainly have recourse in his researches on the theory of magnetism.

As early as the year 1837 the space of ground on which the Magnetic Observatory stands was inclosed from the park on the south-east side of the then existing boundary, and in the spring of 1838 the observatory was built. It is necessarily placed at a considerable distance from the astronomical buildings, and iron is carefully excluded from every part of it. You will observe that it is cruciform, with equal arms, which are in the direction of the cardinal magnetic points. The northern arm is separated from the rest by a partition, and is used as the office and computing-room of this part of the establishment

We shall better understand the nature of the instruments employed by considering what are the facts which we desire to get knowledge of by observation. Every one knows what a magnet is, that is, a piece of iron permanently affected by magnetism, and rendered capable of attracting other pieces of iron towards itself, and, when left at rest, or freed from the action of gravity, of assuming some definite position of equilibrium. Now the object of magnetic observations is to elicit the direction and intensity of the earth's magnetism at any particular point of her surface by means of such magnets. Every one also who is at all acquainted with mechanics is aware that a force is capable of being resolved in two or more directions, so that we may have several forces acting in several directions which shall produce exactly the same effect as a single force in some other direction. Taking advantage then of this law, we propose to ourselves to determine the direction of the vertical plane in which the force of magnetism is exerted for this locality, and the intensity of the forces, or rather the variations of force, from day to day in the vertical and horizontal directions.

Now the obvious way to determine the *direction* of the force is to hang up a magnetized needle by a wire or a string without twist, and to determine the direction in which it will hang with regard to some well-determined line on the earth's surface, for instance with the north or south line or astronomical meridian of the place. And this is what is in fact done by means of the instrument in the south arm of the cross, called technically the *Declination Magnetometer* (the old nautical term variation being replaced by the less ambiguous one declination). A large bar magnet, contained in a double box covered with gilded paper, is suspended by several parallel threads of raw or untwisted silk, so as to give as little tension or twisting force as possible, the magnet itself being held in a stirrup in a horizontal direction, and the threads passing over a reel at the top of a wooden suspension-frame, and being tied to a string so as to be at the command of the observer below, for the purpose of elevating or depressing the magnet. The gilded boxes are used to prevent the disturbance that is caused by currents of unequally-heated air which tend to keep the magnet in a state of vibration. On the magnet are screwed two frames on opposite sides of its centre, one containing a lens, and the other a cross-wire, the direction of the line joining the centre of the lens and the cross being the immediate subject of observation. This cross is observed by means of the theodolite on the pier near us, the telescope of which has a micrometer attached to its eye-piece, the circle of the theodolite and the micrometer both being read for each observation.

A reading is thus obtained for the direction of the line nearly corresponding to that in which magnetism causes the bar to rest, and a corresponding reading for the astronomical meridian being obtained by transits of stars near the pole, the difference of these gives the magnetic declination, or subject of observation. It may be perhaps desirable to mention that we do not observe directly the direction of the magnetic axis of the bar by this means, but that of a line nearly but not quite parallel to it. But supposing we were to reverse the position of the magnet in its stirrup so that the frames which are now west of it should be east, and repeat the observation, it is evident that we should obtain (supposing there were no change of magnetic direction between the observations) double the amount of the error arising from this cause, and the error (similar to the error of collimation of the transit instrument) is actually measured thus once at least every year. To check the vibrations that may arise from any accidental disturbance of the magnet, it is surrounded with a circuit of pure copper which may be seen through the hole in front of the box. The daylight is thrown into the box through the aperture at the back of the box by means of a reflector, and at night an ordinary oil lamp is employed. In our present observations of this and the other instruments, we must be understood as describing their ordinary use independently of the means by which they are made to register their results photographically. This we shall give a brief description of afterwards.

The next instrument which claims our notice is the *Bifilar Magnetometer* or instrument for measuring the variations of the force of magnetism resolved horizontally. Its name is descriptive of its construction. It consists mainly of a magnet suspended by *two* strings at a small and definite distance asunder. It is plain that if we were to suspend a heavy unmagnetized bar of any kind by two strings of equal length from the ceiling of a room, it would remain at rest only in that position in which it and the strings were in the same vertical plane, and if we were to turn it round out of this position, it would resist our efforts and endeavour to resume its former position of equilibrium with a force proportional to its weight and the angle through which it had been twisted. This principle of the *force of torsion* is ingeniously applied to measure the variations of the force of magnetism. A magnet placed horizontally in a metallic suspension-piece is suspended by two strings hanging in a vertical plane nearly at right angles to the direction of the declination-magnet or to the magnetic meridian. The upper part of the suspension-piece carries a plate with a pair of small pulleys attached to it, under which two halves of a skein of silk pass; and this is connected with a small circle called a torsion circle, which turns with reference to the magnet cell (being held by stiff friction). The magnet is turned round by this means till it will hang in equilibrium in a direction very nearly at right angles to the plane of the meridian, the torsion of the strings (which have been twisted round out of their natural position of rest for an unmagnetized bar) being a force that endeavours to pull the magnet round in one direction, while its own magnetism is employed in trying to turn it in the other direction. Now the force of torsion is very nearly constant, but the horizontal force of magnetism is subject to ceaseless fluctuations which compel the magnet to take up different positions of rest, and these angular changes can be by a mathematical calculation connected with the forces that produce them, so that if they can be measured, the variations of force in terms of the whole magnetic force will be found. For this purpose a small plane mirror, which you may see through a glass in the aperture of the side of the box, is attached to the frame that carries the magnet, and necessarily revolves with it, and, a scale properly divided being placed on the south wall of this arm of the building, its divisions reflected in the mirror are observed on a wire of the observing telescope directed towards the mirror. The general principles of this instrument will, it is hoped, be understood by this brief description, and we have no time for more details. We will therefore pass on to the remaining magnetical instrument contained in the box in the western arm of the room.

This instrument is the *Balance Magnetometer*, for measuring the variations of the vertical force of magnetism. Its principle can be explained in few words. A magnet placed nearly at right angles to the magnetic meridian is made to vibrate like a balance on agate planes, being inserted in a brass frame to which two steel knife-edges are attached, and is kept horizontal or nearly so by small weights placed near its extremities above and below the centre of gravity. By shifting the position of these weights, the inclination of the magnet to the horizon, as well as the height of the centre of gravity, can be altered.

On one side of the centre of the magnet a mirror is placed in an inclined position, which serves to reflect light from the divisions of an engraved scale placed vertically near the observing telescope into the telescope. The observations are thus made precisely in the same manner as with the instrument last described, and the observed variations in the scale-divisions can be readily reduced to the required variations of the vertical force of magnetism.

The principle of construction of each of the three principal magnetic instruments having been described, it remains for us to show how the magnets are caused by photography skilfully applied and adapted, to register their own results with no more labour to the person employed than supplying them punctually and liberally with properly-prepared paper, and keeping their lights always properly burning. It is proper to mention previously that the merit of having so successfully accomplished this desideratum in practical science is due to Mr. Brooke, a medical gentleman of London. By saying this we do not in the least wish to detract from the merits of similar inventions by Mr. Ronalds, who for some years has with great skill and zeal gratuitously conducted the meteorological observations of the Kew Observatory, but we shall afterwards have an opportunity of describing the peculiar and ingenious methods of this gentleman when we come to the description of the latter observatory.

We shall attempt only an explanation of the general principle of the photographic method, and of its application to the purpose of making the magnetical and other instruments self-registering; a description of the exact mode of treatment applied to each instrument would exceed the limits to which we must confine ourselves.

Most persons are familiar with the process by which paper is prepared so as to render it extremely sensitive to the action of light. It is first washed with a solution of isinglass, bromide of potassium, and iodide of potassium in proportions of nearly 1, 3, and 2, and may, when carefully dried, be put away in a drawer till it is wanted for use. When required for use it is placed in a darkened chamber and washed with an aqueous solution of nitrate of silver, and is then in a proper state of sensitiveness to the action of light, so that if a beam of strong light be allowed to fall upon any part of it, an impression is made upon that part, which is, however, invisible till the paper is washed with a solution of gallic acid, with a small admixture of acetic acid. Imagine, then, a sheet of paper properly prepared to be rolled round the glass cylinders, several of which we see before us, or rather between two such cylinders for the purpose of keeping it safely in one invariable position. Each cylinder has one hemispherical end, and the inner one is stopped at the other end by insertion in a metallic cap, in the centre of which is a short spindle and winch-arm. On the rim of the metallic plate is placed a collar of tape, which gives friction enough to keep the cylinders with the paper between them firmly in one position. The cylinders are then mounted with their axes horizontal, the short spindle at one end and the hemispherical termination at the other, resting on friction rollers. The winch-arm is lodged in a fork at the end of the hour-end of a time-piece with very strong wheels and powerful spring and with duplex escapement, and the cylinders with the registering paper are thus made to revolve uniformly so as to complete a revolution in twelve hours. We must now describe how the light is thrown upon the paper, and, to fix the ideas, we must be understood as speaking of the declination-magnet, as the principle is nearly the same for all the instruments. A gas-light is placed a little out of the direction of the straight line joining the suspending skein of the magnet and the middle of the cylinders, and light passing from it through a small aperture falls upon a concave mirror carried by part of the suspension-apparatus of the magnet. The rays of light thus reflected from the mirror are made to converge pretty nearly upon the paper on the cylinder, the effect of the oblique reflexion being diminished by a plano-convex cylindrical lens of glass placed before the cylinder with its axis horizontal.

The cylinders are completely covered over with a double case of blackened zinc, having a slit on each side in the same horizontal plane as the axis of the cylinder; and the beam of light throughout its whole course is, as you see, protected by zinc tubes from the admixture of extraneous light. Through the slit on the north side the light from a fixed gas-flame is admitted to the cylinder, and thus a fixed line is marked, which serves as a base or line of reference for measurement. Thus, then, as the magnet, throughout the day and night, is constantly making small excursions on one side and the other of its mean position, this faithful and ever-watchful assistant is as constantly recording even the slightest movement, and tracing a zigzag line on the paper, from which the positions can be readily computed, for any given instant, with as much accuracy as if they were made in the ancient or ordinary way which has already been described. But to reduce the observations to the same scale as the ordinary observations, it is necessary, at certain times in the day, still to record the indications of the magnets in the ordinary way, and these observations being compared with the photographic indications given for the same times, afford means for the reduction of all the observations to the same scale as if all had been made in the ordinary way. The same cylinder is made to record the indications of two instruments by being so placed that the light recording the movements of each shall fall on opposite sides of it. Thus in 24 hours each paper exhibits two double traces (the cylinders making two complete revolutions in that space of time) with a corresponding base line, which serves for both instruments; the cylindrical paper used for the declination magnet, for example, carries also the trace of the bifilar magnet; and that used for the vertical-force magnet carries also the trace for the barometer.

This latter instrument is a large syphon barometer, and may be briefly described as follows:—A glass float on the mercury in the shorter leg of the syphon is partially supported by a counterpoise acting on a light lever turning on delicate pivots, leaving a certain portion of the weight of the float to be supported by the mercury. The lever is lengthened to carry a vertical plate of opaque mica, with a small aperture, and through this aperture the light of the gas-lamp, collected by a cylindrical lens, shines upon the photographic paper.

Under a shed in the grounds are placed two thermometers (a wet-bulb and a dry-bulb thermometer), giving photographic indications by means very similar, the cylinders being vertical and the divisions of the thermometers being marked on the paper by the absence of light at the intervals where it is intercepted by wires placed across the tubes at every degree. The bulbs of the thermometers are large and the cylinders long.

We have still to describe the electrical apparatus, before leaving the Magnetic Observatory. This consists of two distinct parts, viz., of the instruments which we see in the window, communicating directly with a series of vertical brass rods, which project from a long horizontal brass tube carried by an insulating double cone of glass kept warm by lamps, and of the apparatus at the top of the lofty pole outside the building. This latter consists mainly of a copper tube 5 ft. in length, carrying at its lower extremity a copper umbrella, which is fixed upon the top of a truncated cone of glass for insulation. The glass is hollowed out beneath, a cone of copper being placed in its conical hollow, and the heat of a lamp placed beneath it serves to keep the glass in a proper state for insulating perfectly. The box containing the glass, &c., is fastened to a vertical plank, which is attached to perforated iron bars, sliding upon iron rods, that guide the apparatus in its ascents and descents. Near the bottom of the pole is fixed a windlass, the rope of which passes over a pulley in the cap of the mast and sustains the apparatus. When the apparatus is lowered, the conducting wire is coiled upon a self-acting reel, which is urged by a weight, but which may be better understood by actual inspection. The atmospheric electricity is collected by means of the flame of a large lamp placed on the top of the copper rod, and is conveyed to the instruments within the room by the conducting wire soldered on to the outside of the copper umbrella beneath the cap. The instruments consist of a double gold-leaf electrometer, two Volta's electrometers, a Henley's electrometer, a Ronalds' spark measurer, a dry-pile apparatus, and a galvanometer. The electrometers and the spark measurer were originally constructed under the superintendence of Mr. Ronalds, of whom we shall have occasion to speak in connection with the Kew Observatory.

Near the southern boundary of the grounds is a shed containing an apparatus for determining the absolute intensity of the horizontal force of magnetism. A graduated circle is fixed to a tripod stand, with its plane horizontal, and two planks at right angles to each other turn horizontally on a pin at its centre. Upon the centre of the plank is fixed a box carrying a suspension-apparatus for a magnet, which is deflected by another magnet placed at small measured distances, in the same plane, and at right angles to it. At one end of one of the planks is fixed a telescope with a wire in its focus, and a short scale to be viewed by reflexion in the mirror carried by the suspended magnet. The division of the scale which is on the wire when the deflecting magnet is away being noted, and the circle microscopes being read, the deflecting magnet is laid at one of the measured distances, and the planks are turned round till that division is again on the wire, when the microscropes are read again. The difference of the readings gives the disturbing effect of the magnet. In practice, however, the deflecting magnet is generally placed with its poles successively in opposite positions, and the difference of readings is then double the effect of the disturbance. By combining such observations with the observations of vibration of the deflecting magnet, data are found for determining the energy of the magnetic force that influences the magnets.

In an opposite shed or wooden erection is an excellent dipping needle by Robinson, with which the magnetic dip is determined three times on the Monday of every week.

Besides the meteorological instruments which give self-registering indications by the photographical and other processes which have been described, there are others yet to be mentioned.

Of these the chief is the standard *Barometer* by Newman, which is fixed at the south-west re-entering angle of the Magnetic Observatory. The tube is nearly six-tenths of an inch in diameter; its graduated scale is of brass, and to it is affixed a brass rod passing downwards and terminating in a point of ivory. In observation, this point and its image reflected in the cistern of mercury are brought into contact. The readings of this barometer are very nearly coincident with those of the Royal Society's flint-glass standard barometer.

The *Thermometers* generally are placed on a vertical revolving stand, placed at some little distance south of the Magnetic Observatory. This stand revolves freely on a vertical post, and is composed of a vertical board, turned away from the sun, to which the thermometers are attached, and of two inclined boards separated by an interval of some inches, of which the outer one is turned towards the sun. An effectual screen is thus formed from the direct effects of the sun's rays, while there is nothing whatever near the thermometers to affect the temperature of the air. On the stand are placed a standard thermometer for the temperature of the air, a dry-bulb and a wet-bulb thermometer for determining the temperature of evaporation and of the dew-point, self-registering ordinary maximum and minimum thermometers, and self-registering wet-bulb maximum and minimum thermometers.

A case to the east of this stand contains the tops of the tubes of four thermometers sunk in the ground at the depths respectively of 24, 12, 6, and 3 French feet for the determination of the temperature of the earth and its variations at different depths below the surface.

On the ground, near the stand carrying the thermometers, are two rain-gauges, one on Crosley's construction, self-registering, and the other a plain cylindrical gauge. A third gauge, also cylindrical, is also placed on the leads above the library.

A small area is railed off for the placing of thermometers used for making experiments on the radiation of heat from different substances, which were most elaborately conducted by Mr. Glaisher, the superintendent of this department of the observatory, and of which the results are given in the *Philosophical Transactions.*

There is also a thermometer exposed to the full rays of the sun, and another thermometer with its bulb placed in the focus of a parabolic reflector for terrestrial radiation.

This completes our survey of the principal instruments of the observatory. The accounts given of them, and the descriptions of their mode of use, and of the general features of the establishment, are necessarily imperfect, though, even now, they will, to many persons, seem unnecessarily long and tedious. Enough has been shown to give an idea of the laborious methods practised by the astronomer, and of the undeviating rigour and punctuality with which his duties are performed. Day after day, and night after night, he is slowly and painfully adding to the heap of facts which furnish the materials for future discovery, and for correcting still further every element in the theory of the celestial bodies with which he is already conversant.

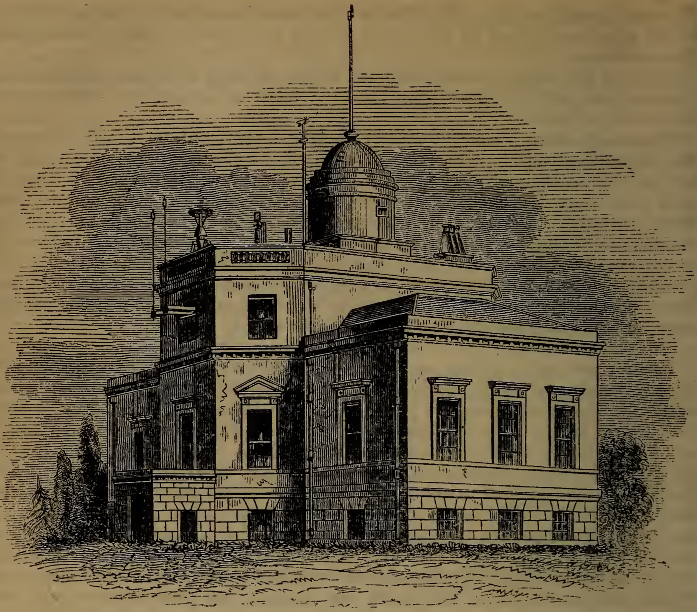
The visitor either before or after his visit to the Royal Observatory will most probably pay a visit also to the other admirable and far-famed institution of the town of Greenwich, viz. its Hospital and Schools. The latter have long been famed for the excellent training given to the boys in nautical astronomy, and chiefly for the skill with which they have been taught to observe with the sextant and other instruments. At the present time an observatory, well furnished with first-class instruments, is being erected for their use under the direction of the Rev. George Fisher, the Chaplain to the establishment. It does not fall within our province to give a formal description of these, but it may be interesting to know that the transit-instrument and mural-circle which are to be erected here are the same instruments which were used formerly with so much effect at St. Helena by Mr. Johnson, the present director of the Oxford Observatory.

THE KEW OBSERVATORY.

We propose to give, in the next place, a description of the Observatory at Kew, established in 1842, under the auspices and at the expense of the British Association for the Advancement of Science.

The building appropriated for the magnetical and meteorological observations contemplated by the Association, is that which was built about the year 1768, by Sir William Chambers, for his Majesty King George III., for an astronomical observatory. It is beautifully situated in the Old Deer Park, Richmond, upon a promontory formed by a flexure of the river, from which its least distance is 924 ft. The situation is favourable for electrical observations, the highest trees near it being some feet lower than the top of the dome that surmounts the building. The building was originally arranged for apartments to receive a transit-instrument, a mural quadrant, and an equatorial instrument. On entering the building by the flight of steps on the north side the visitor finds himself in a fine hall, exactly corresponding with an apartment immediately in front of it on the south side. The apartments to the right and left on the south side of the building contain the transit-instrument and the great mural quadrant. The room above the south central room is appropriated as a kind of study and laboratory; and this room, and the rooms below it, are lined with glass cases, containing philosophical instruments and objects of natural history. The rooms in the same story are used as dwelling apartments for the observer and keeper of the building and their families, and one or two other rooms are occupied as sleeping apartments.

In the year 1842, on a representation made by the British Association to her Majesty's Commissioners of Woods and Forests, the building was appro-



KEW OBSERVATORY.

priated to their use, and the laborious charge of arranging for the necessary instruments, and of superintending the observations, was generously undertaken by Francis Ronalds, Esq., a gentleman well known for his previous researches in electricity and meteorology generally. From that time to the present he has devoted himself almost exclusively to this task; and the science of atmospheric electricity, not to speak of other branches of meteorology, is mainly indebted to him for its present state of advancement.

Mr. Ronalds' researches were at first chiefly directed to the observation of electrical phenomena, and for this purpose the dome originally intended for an equatorial instrument was appropriated. The apartment beneath the dome is composed chiefly of wood covered by sheet copper, and is erected on a very solid wall built up from the foundation. The dome itself is moveable by well-contrived rack-work, and it has the usual sliding shutters.

To adapt the dome for an electrical observatory a circular hole has been cut through its centre, and in it is fitted a smooth mahogany varnished cylinder. A strong cylindrical pedestal, surrounded by a stage reached by steps, is fixed in the centre, for placing the principal conductor, which is a conical tube of copper, 16 ft. long, entering into a brass tube beneath it. This latter surmounts as a cap a well-annealed hollow glass pillar that rests upon the centre of the pedestal, to which it is securely fixed by eight bolts passing through a strong wooden collar into the table forming the top of the pedestal. On the brass cap surmounting the insulating glass column is fixed a spherical ring carrying four arms at right angles to each other, and by means of these arms is effected the connection of the conducting rod and the electrometers beneath in a way that needs no particular description. A small lamp is placed beneath the glass column to secure the proper warmth for perfect insulation, and to the top of the conducting rod Volta's small lantern is fitted, in which a light is kept always burning. Just above the opening of the dome there is fitted in the brass tube a small inverted copper dish or umbrella, to protect the instruments from the rain.

The instruments which are usually kept in connection with the conductor are similar to those used at Greenwich (indeed it must be kept in mind that the electrical apparatus at Greenwich was copied from that at Kew, with such modifications as were necessary, and that Mr. Ronalds gave his willing and able assistance in every part of it). The action of the Kew apparatus is, however, much more continuous and perfect than that at Greenwich, owing, probably, to the length of the conducting wire used with the latter.

The expressed object of the establishment at Kew was the construction and working of self-registering meteorological instruments, and to this subject Mr. Ronalds devoted a considerable portion of his attention from the commencement, but chiefly with regard to the electrical observations.

For some time the indications of the electrical state of the atmosphere were obtained by putting in connection with the conductor a circular plate of tin or glass, covered with a thin layer of shell-lac or resin. This plate, being carried round by clock-work, becomes electrified in the line and neighbourhood of its contact with the conductor, and, on being removed and well powdered with chalk, exhibits very interesting figures by the adhering of the chalk to those parts. In 1845, however, Mr. Ronalds was enabled to supersede this instrument by a more efficient one constructed on photographic principles which we will briefly describe, from the account given by Mr. Ronalds in a paper read before the Royal Society, in January, 1847.

"A rectangular box, about 16 in. long and 3 in. square, constitutes the 'body' of a kind of lucernal microscope. A voltaic electrometer (properly insulated, and in communication with an atmospheric conductor) is suspended within this microscope, through an aperture in the upper side, and near to the object-end. That end itself is closed by a pane of glass when daylight is used, and by condensing lenses when a common Argand lamp is employed. Between the electrometer and the other or eye-end of the microscope, fine achromatic lenses are placed, which have the double effect of condensing the light upon a screen situated at the eye-end, and of projecting a strong image of the electrometer in deep *oscuro* upon it. Through the screen a very narrow slit of proper curvature, in a horizontal position, is cut, and is fitted into the back of a case fixed to the eye-end of the microscope, at right angles to its axis and vertical. Within this case is suspended a frame, provided with grooves, into which two plates of pure thin glass can be dropped, and brought into close contact by six little bolts and nuts. This frame can be removed at pleasure from a line by which it is suspended; and the line, after passing through a small aperture cut through the upper end of the long case, is attached to a pulley fixed, with capacity of adjustment, to the hour-arbor of a good clock.

"A piece of properly-prepared photographic paper is now placed between the two pieces of glass in the moveable frame; the frame is removed (in a box purposely made for excluding light) and is suspended in the long case; this is closed, so as to prevent the possibility of extraneous light entering it; the clock is started, and the time of starting is noted.

"All that part of the paper which is made to pass over the slit in the screen by the motion of the clock becomes now, therefore, successively exposed to a strong light, and is consequently brought into a state which fits it to receive a dark colour, on being again washed with the usual solutions, excepting those small portions upon which dark images of the lower parts of the pendulums of the electrometer are projected through the slit; these small portions of course retain the light colour of the paper, and form long curved lines or bands, whose distances from each other at any given part of the photograph *i. e.* at any given time, indicate the electric tension of the atmosphere at that time."

By this account it will be readily seen that the principal difference between this method and that of Mr. Brooke, which is used at Greenwich, neglecting the mechanical adaptations, consists in this, that in the former case the light is excluded from those parts of the paper which are to receive the trace, and in the latter case it is admitted only to those parts.

Mr. Ronalds has successfully applied a similar method of self-registration to the barometer, the declination-magnet, and the horizontal-force and vertical-force magnets.

The observatory is supplied with the usual meteorological instruments, viz. a barometer for use in the ordinary way, thermometers, hygrometers, rain-gauges, and anemometers.

We must, in conclusion, not omit to draw the visitor's attention to the storm clock used in connection with the Electrical Observatory, which empowers an observer to set down multifarious events occurring in very rapid succession, with accuracy and comparative ease.

The greater number of the scientific visitors of London will doubtless visit the two great Universities of England, Oxford and Cambridge; and a short description of the observatories connected with them will, therefore, not be out of place.

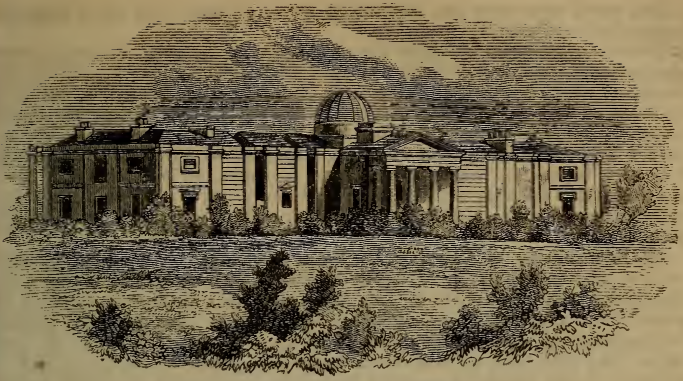
We will commence with the latter, because its series of published observations commences earlier, though we mean no comparison of the merits of these excellent and most active institutions.

THE CAMBRIDGE OBSERVATORY.

The Cambridge Observatory is situated on the road to Madingly, about a mile to the west of Cambridge, on a gently-rising ground, commanding a good north and south horizon. It was built in the years 1822 to 1824, after the designs of Mr. J. C. Mead, at an expense of upwards of 18,000*l.* It is a handsome Doric building, with a portico in the centre, and surmounted by a central dome. The east end of the building is appropriated to the use of the astronomer, and the apartments of the assistants are at the other end. To the west of the central portico are situated successively the rooms for the mural-circle and transit-instrument; and a little to the west of the building is the dome erected in 1838 for the magnificent Northumberland equatorial.

On the foundation of the observatory, it was put under the charge of Professor Woodhouse, so well known for his treatises on astronomy and other valuable works. The present Astronomer Royal, Mr. Airy (then Professor Airy), succeeded him in 1828, and, on his removal to Greenwich in 1835, he was succeeded by Professor Challis, the present director of the observatory.

Professor Airy's appointment forms an epoch in modern astronomy. He assumed as his first principle from the commencement that unreduced observations were worth comparatively little, and he set the example, which has since been followed by all English astronomers, of thoroughly reducing his observations and of rendering them fit for the immediate use of the theoretical astronomer. It had been the practice also before his time to observe the superior planets only about the time of their apposition, and even the Greenwich planetary observations of that period were few in number, and, to use Mr. Airy's own words, "not sufficient to assist in any material degree for improving the theory." From the first establishment of the mural-circle at Cambridge, this defect was obviated, and all the planets were observed on the meridian that did not pass later than two o'clock in the morning, the observing force (consisting of two assistants) not being large enough to admit of observations throughout the night. The Cambridge observations commencing



CAMBRIDGE OBSERVATORY.

with 1828, and the Greenwich observations commencing with 1836, form one continuous series, observed with the same accuracy, and reduced according to the same plan and with the same elements, and are the most valuable contribution to the astronomy of the age.

The transit-instrument was constructed by Dollond, in 1824. The focal length of the object-glass is nearly 10 ft., and its aperture nearly 5 in. Its supports are massive stone piers, and the pivots of the axis, which are of bell-metal, turn in brass Ys, which have the usual adjustments. In the focus of the eye-piece are seven fixed vertical wires, and one parallel to them moveable with a micrometer.

The mode of use, illumination of the field, &c., are precisely similar to those of the Greenwich transit-instrument. The clock was made by Hardy and has Hardy's escapement.

The mural-circle was constructed by Troughton and Simms, and was mounted in the autumn of 1832. Its diameter and the length of the telescope are each 8 ft.; and the aperture of the object-glass is 4½ in. It is in every essential respect similar to the Greenwich instrument, and is used in precisely a similar way.

The clock used in the circle room is by Molyneux, and admits of immediate comparison with the transit-clock.

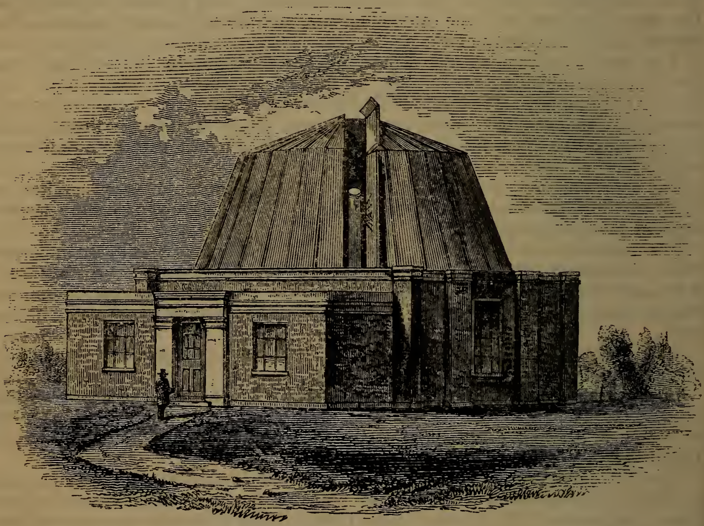
It must be borne in mind, in connection with the mural-circle, that the process of making a complete double observation, by direct vision and by reflexion, at the same transit of a star, was practised first by Mr. Airy at Cambridge.

The 5-ft. equatorial in the dome that surmounts the building was erected in 1832, by Mr. Thomas Jones. It rests on a stone pillar whose height above the level of the ground is about 26 ft. The polar axis consists of four brass cylinders fixed at their ends to two brass frames, in the centres of which are the pivots. The pivots are supported by stone piers rising from the pillars; and the upper pivot is surmounted by an open iron frame about 3 ft. long. The declination-circle (3 ft. in diameter) consists of two flat rings, containing the telescope between them, and connected by bars across. One ring is graduated to every 5′, and the other is grasped by the clamp of the tangent-screw. The hour-circle is attached to the frame carrying the lower pivot, and has two sets of graduations, one in time and the other in space. Its diameter is 2 ft. The length of the telescope is 5 ft., and the aperture of its object-glass is 2¾ in.

The clock used with the instrument is by Graham, and has a dead-beat escapement and gridiron pendulum.

The last instrument which we have to describe is the great Northumberland equatorial, the pride and boast not only of the observatory, but of the university to which it belongs. This noble instrument was the gift of the Duke of Northumberland, the former chancellor of the university, and has already added to English astronomical fame by the successful search after the new planet Neptune. The planet was really observed by Professor Challis twice with this instrument before its discovery by Galle, at Berlin, though it was not recognised till after the date of that discovery. It is now employed principally in the observation of double stars and of the recently-discovered small planets*.

The object-glass, by Cauchoix of Paris, is of 11½ in. effective aperture, and the focal length of the telescope is 19⅓ ft. The mounting is that which has been generally used with English equatorials, that is, the telescope is in the plane of the polar axis. The advantage of this construction is, that it prevents the necessity of reversing the instrument when an object comes to the meridian. The polar axis consists of six stout deal poles, the ends of which are fastened to two six-sided cast-iron frames, at the centres of which are the upper and lower pivots. The poles are braced across their middle by transverse iron bands, counter to which 24 deal spars, crossing each other two and two and abutting near the middle of the poles so as to thrust them obliquely outwards, are made to act by means of screws which turn in shoulders on their opposite extremities and press against the iron frames. These answer the double purpose of giving stiffness to the polar axis and adjusting the iron frames so as to be perpendicular to the axis of the instrument.



NORTHUMBERLAND EQUATORIAL.

The support of the upper pivot consists of two strong wooden beams connected by two cross iron bars and surmounted by a triangular iron frame, at the apex of which is the Y for the pivot. The braces are inclined to each other in a plane at right angles to the meridian, and deviating a little from the vertical towards the south; their lower extremities, which are armed with iron offsets, are firmly embedded in brick-work, and their narrow faces are turned towards the polar axis. By this construction the view of no part of the heavens is materially obstructed. The support of the lower pivot is a large stone slab resting on a mass of brick-work at a slight elevation from the ground. This pivot turns in a socket carried by a square mass of iron which is moveable by adjusting screws.

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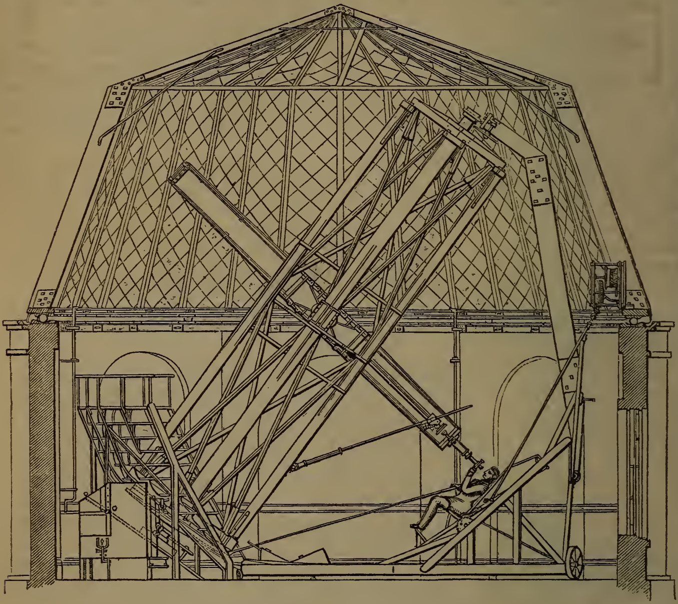
* The description is taken mainly from the Introduction to the Cambridge Observations for 1838.

The tube of the telescope is made of well-seasoned deal. The pivots of the axis about which it moves, turn in cylinders formed of brass pieces furnished with adjusting screws, and fixed to two opposite poles of the polar axis, the telescope-tube just passing between the other four. Attached to one side of the telescope-tube is a flat brass bar nearly 6 ft. in length, carrying a small graduated arc perpendicular to its length at one end, and turning at the other about a pin fixed in the telescope tube at the distance of 2½ ft. from the axis of revolution of the telescope. This arc (called the declination sector) serves to measure small differences of declination, and is read by a micrometer microscope fixed to the telescope-tube.

The hour circle is 5½ ft. in diameter. It is not permanently attached to the polar axis, but can be clamped to or released from the lower iron frame at pleasure. There are two indexes with verniers; one fixed to the support of the lower pivot, and the other fixed to the iron frame. By setting the latter to a certain angle, known by an observation of a known star, the telescope can be directed to a given right-ascension at a given sidereal time, by means of the other index in the usual manner. The graduation of the circle has been performed with great care by Mr. Simms (who performed generally the graduations and the optical part of the instrument), and by the aid of the verniers can be read off to 1s. of time. The outer rim of the circle is cut with teeth, to which an endless screw, connected by a brass rod with a large clock, can be applied at pleasure, for the purpose of giving a movement to the instrument about the polar axis. The clock is moved by a heavy weight, by which the going can be maintained during the act of winding up. The clamping of the hour-circle to the iron frame is effected by a tangent screw clamp fixed to the frame, by means of which, with the aid of a handle extending to the place of the observer, he can, when the endless screw is applied, give motion to the instrument, through a limited space, upon the hour-circle. The rate of motion given to the hour-circle by the clock is not affected by this movement. Hence supposing the hour-circle to go exactly sidereal time, small differences of right ascension can by this contrivance be measured by reading off the angles pointed to by the moveable index before and after the changes of position.

It would be impossible to give in a popular sketch an idea of the mechanical contrivances applied in the construction of the dome for sheltering this gigantic instrument. After considering with extreme care every form of mounting for the revolving part, Mr. Airy, who had taken the charge of erecting the instrument, came to the conclusion that the only construction that would answer for so large a structure, so as to give the requisite facility of movement and freedom from the danger of occasional jamming, is that in which the dome turns upon free balls between concave channels. This construction has been adopted, and the only danger against which it has been found necessary to guard is that of its being dislodged or blown over by wind or unusual disturbances. This has been obviated by four holdfasts of a peculiar construction. The winch which acts upon the machinery for turning the dome is carried to the observer's chair, so that he can, while engaged in a long observation of any object, turn the dome slowly without descending. The accompanying sketch will give a very intelligible idea of the general form of the dome.

The great length of the telescope rendering it necessary to provide special means for easily placing the observer in all positions in the surface of a sphere whose centre is the centre of the telescope, this is accomplished by making a frame, of which the upper edge is nearly a circular arc whose centre is the centre of the telescope, and causing the frame to traverse horizontally round a pin in the floor exactly below the telescope centre; the observer's chair then slides on the chair-frame. The observer has the power, by means of a winch, of turning round the frame that carries himself and the chair; and also by means of a lever and ratchet-wheel, of raising or lowering the chair on the frame. He can also raise or depress the chair-back, which is adjustible in height, and can thus without leaving his seat obtain the most convenient position for observing his object and follow it in its diurnal course.

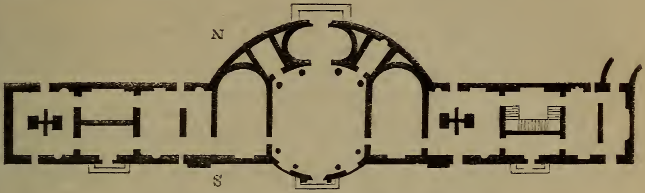


THE NORTHUMBERLAND TELESCOPE.

Besides the systematic observations of planets on a better plan than was formerly practised, a valuable catalogue of 726 stars observed during the directorship of Mr. Airy, and reduced by him, may be numbered amongst the valuable contributions to astronomy that have come from this observatory. In taking our leave of this noble institution, we cannot wish it a better fate than to be always under management so honest and so able as that of its former and its present director.

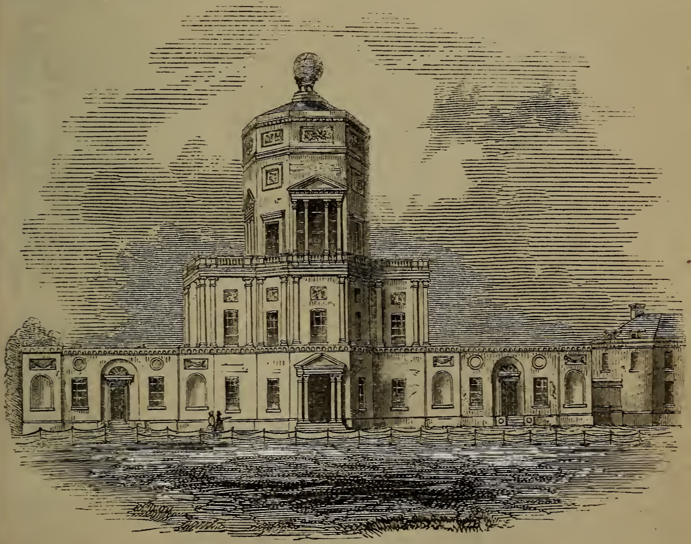
THE RADCLIFFE OBSERVATORY AT OXFORD.

The Radcliffe Observatory owes its origin chiefly to the exertions of Dr. Hornsby, Savilian Professor of Astronomy in the University of Oxford, in the latter part of the last century. The attention of the University authorities had been drawn by him to the need of an establishment for the extension of astronomical science, as well as for the practical teaching of it in the University, and the Radcliffe trustees were induced by their representations to appropriate part of the funds bequeathed for scientific purposes, to this object, and the building was begun about the year 1771. In 1774 it was sufficiently advanced to receive the instruments, though from various causes of delay the works were not completed till the year 1794. The administration of the observatory has been always vested in the hands of the trustees; and the whole expense of its equipment and management has been defrayed by the funds at their disposal.



GROUND PLAN OF THE RADCLIFFE OBSERVATORY.

The office of Radcliffe observer has been successively filled by Dr. Hornsby, Dr. Robertson, Professor Rigaud, and the present director, Manuel J. Johnson, Esq. The latter gentleman has succeeded, by his indefatigable zeal and industry, in raising the observatory to a very high rank amongst similar modern institutions, and there is perhaps not one which, with so small an amount of observing and computing force, has produced so large a mass of accurate and well-reduced observations.



SOUTH FRONT OF THE RADCLIFFE OBSERVATORY.

On taking the directorship in 1839, Mr. Johnson determined to devote himself to star-observations, and selected for re-observation the valuable and well known circumpolar catalogue of Groombridge. This catalogue contains more than 4000 stars; and, with the services of only one assistant, he has succeeded not only in completing his task, but in giving to the public the results of the observations perfectly reduced, in yearly volumes issued with undeviating punctuality. Indeed it is only justice to state that Mr. Johnson's volumes have been published earlier than those of any other observatory, not excepting Greenwich. Astronomers are now expecting with eagerness the catalogue which shall combine the results of all the observations, and on which, without any relaxation of zeal, he is busily engaged.

The building is an elegant structure, of which the general plan will be well understood by the preceding engraving of its south aspect. The dwelling house of the director is seen to the east of it, and communicates with the observing and public rooms by means of a covered stone passage.

In the centre is a lofty hall, from which a staircase leads to the upper apartments, originally intended for lecture-rooms and for receiving books and instruments. The whole is surmounted by an elegant tower, with a ball on the top of it, commanding a perfect view of the heavens. On the sides of this tower are emblematical figures, copied from the Temple of the Winds at Athens.

The building having been originally intended for the double purpose of an observatory and an observing school, contains two suites of rooms adapted to each of these purposes. Those of the west wing were devoted to the latter object, and contained a small transit and a mural arc. The other instruments were originally two brass 8 ft. quadrants, a 12 ft. zenith sector, and an 8 ft. transit; and for extra meridional observations there were an achromatic telescope by Dolland, with object-glass of 4½ in. aperture and 10 ft. focal length; a 42 in. achromatic, with triple object-glass of 3¾ in.; and a 10 ft. Newtonian, by Sir William Herschel.

We will now proceed to describe briefly the instruments in use at present.

Transit Instrument.—On Mr. Johnson's appointment to the observatory, the 8-ft. transit made by Bird was in use. The telescope of this instrument had an object-glass of 4 in. in diameter, by Dolland; the length of its axis was nearly 4 ft., the pivots were 1·6 in. in diameter, and did not rest in the Ys through their whole length. Counterpoises were originally used, but were removed in a trial to get rid of the unsteadiness observable in the instrument. This, however, proving incorrigible, the instrument was taken to pieces in 1843, and the object-glass, setting-circles, micrometer, and axis-level were used for the construction of an instrument with a totally new mounting. The axis of the new instrument consists as usual of three parts, the central zone and two cones, each of the latter terminating in a cylindrical pivot of hard bell-metal; every care is taken to ensure the most solid connexion of the separate parts.

The telescope consists of two truncated cones, whose bases are secured to the centre-piece by screws from within. Four tension rods help to draw the cones firmly upon the centre-piece, and carry also the frame that supports the diagonal illuminator. The regulation of the light is effected by varying the angle of inclination of the illuminating plate to the axis of the tube.

The length of the horizontal axis exclusive of the pivots is 3 ft.; the pivots are 2 in. in diameter, and 2½ in. in length, of which, however, only 1 in. rests in the Ys, which are those of the old instrument, having the usual screw-adjustments for level and azimuth.

The supporting piers are of Bath freestone and stand on a mass of cement laid on the natural gravel.

Mr. Johnson speaks in the highest terms of the stability of the instrument thus reconstructed.

The Meridian Circle, by Jones, was erected in 1836. It is 6 feet in diameter, and carries a telescope of nearly the same length. It differs from the usual circle in being supported on both sides of the graduated circle, revolving on two pivots of equal diameters. The eastern pivot is placed within a few inches of the graduated circle; the western is at the extremity of a long cone, projecting from the centre-piece of the circle, and both rest in Ys attached to stone piers. The upper part of the eastern pier is circular, and nearly of the same diameter as the circle. On its outer edge are fixed the reading microscopes, four in number, with the axes directed towards the graduations of the interior face of the circle. The telescope is securely fixed between the graduated circle and another parallel to it, and the circles are bound together by stiff braces at short intervals, and the alternate braces are supported by conical radii proceeding from the nucleus. One disadvantage of the construction is that the position of the telescope cannot be changed with regard to the limb of the circle, as can be done with the usual circle.

A large telescope of 7·1 in. aperture, and 10 ft. focal length, by Tulley, is mounted equatorially in front of the observatory*. It is protected from the weather by a small wooden house running on a railroad, which can be readily removed when the telescope is used, and the observations are then made in the open air.

The last astronomical instrument which we have occasion to describe is the magnificent heliometer made by Repsold, lately erected. Through the kindness of Captain W. H. Smyth, we are enabled to present to the reader an excellent wood-engraving of this admirable instrument. The drawing from which the engraving is made was executed by Mrs. Smyth, and Captain Smyth, with his accustomed liberality, has put at our disposal the block, which was engraved at his own expense for a work which he is preparing.

To the English reader, who is unfamiliar with the heliometer, it is desirable to explain that it is a large telescope mounted equatorially in the ordinary way, but with its object-glass divided into two equal parts by a section across the centre. The parts of the object-glass are made capable of moving in their own planes through considerable intervals by means of screws, and thus their optical centres can be separated by a considerable space. Each half-glass will thus form a separate image of any object, and the two images will be at an angular distance depending on the degree of separation of the centres of the glasses. By proper management this contrivance can be made use of to measure the angular distances of objects not very far apart, and, from the circumstance of its having been formerly applied to measure the sun's diameter, is derived the name Heliometer†. It is an interesting fact that with such an instrument the parallax of the star 61 Cygni was measured by the illustrious Bessel.

The annexed woodcut will give the best idea of the general form and appearance of the instrument. We will endeavour by its help to describe the principal details of its construction, first noticing those parts which relate to its equatorial mounting‡.

The instrument is supported by a solid block of Portland stone, which rests on a pillar of brick 4 ft. 6 in. in diameter and about 18 ft. above the surrounding ground. This elevation was necessary in order to raise the instrument above the adjacent observatory.

The Polar axis, of steel, 4 in. in diameter, is contained in an iron case, marked ZZZ in the plate. The polar and meridian adjustments are made by means of screws at the lower extremity. RR is the hour-circle, read off by two

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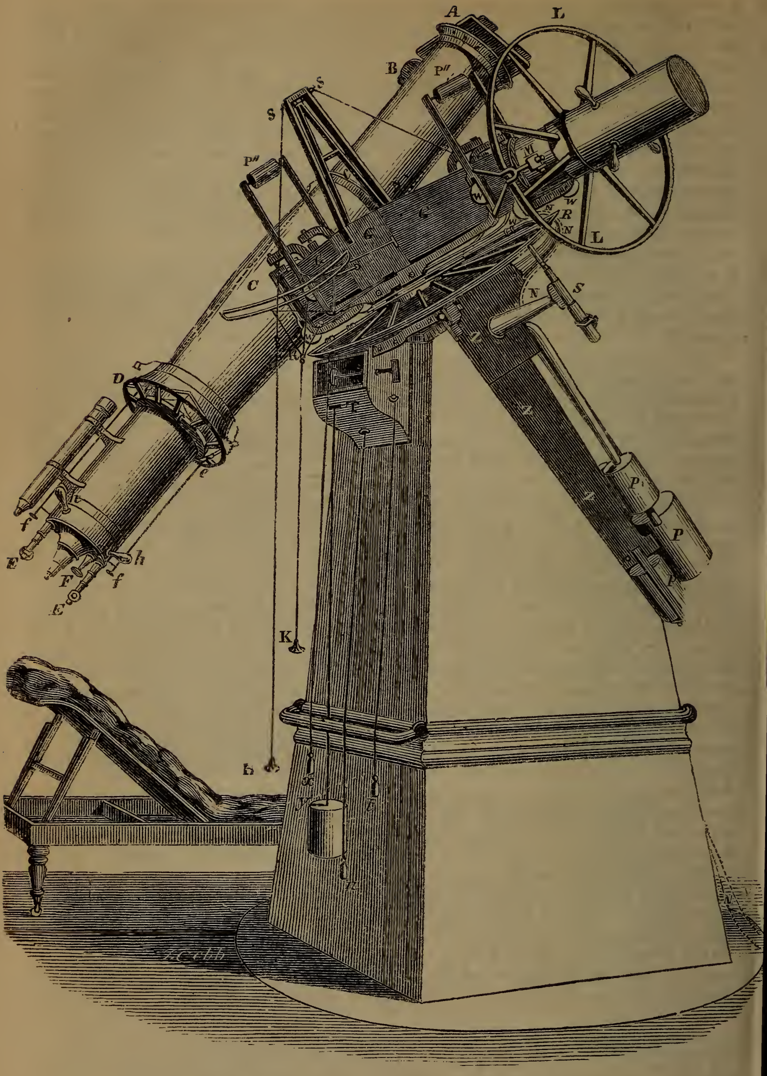
* The object-glass of this telescope was presented by Sir James South to the University of Oxford, and was by that body transferred to the Radcliffe trustees.

† This name is not sufficiently descriptive of the nature and present employment of the instrument. Various names have been suggested at different periods of its history. The elder Dollond called it the *divided object-glass micrometer*, which is also not satisfactory. M. de Charnières, a French naval officer of the last century, who has some claims to be regarded as the inventor of the instrument, called it *megameter* in opposition to *micrometer*, which is, perhaps, the least objectionable name that has been proposed.

‡ For the description we are indebted to the kindness of Manuel Johnson, Esq., the director of the Radcliffe Observatory.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THE HELIOMETER OF THE RADCLIFFE OBSERVATORY.

microscopes, one of which, S, is shown in the plate. L L is the declination-circle likewise read off by two microscopes, one at M, and the other 180° distant from it. The cylindrical piece, projecting beyond the declination-circle, serves as a counterpoise to the telescope. The handles which are seen on this cylindrical piece are for the purpose of moving the instrument, and, by means of them, the observer is enabled to set it in declination very conveniently.

The declination-axis is contained in the iron case GGG; it is made of steel, 4 in. in diameter, being of the same size as the polar axis. P′ is one of the counterpoises of the declination-axis, and there is a corresponding counterpoise on the other side, the top of which is just seen in the plate. To these counterpoises the friction wheels WW are attached, which diminish the pressure of the declination-axis on its Ys. PP are counterpoises for the polar axis. The larger one is connected with a pair of friction-rollers, which are seen edgeways, on the plate, immediately over the hour-circle. P″P″ are smaller counterpoises attached to frames which have a slight motion at right angles to the declination-axis. The small friction-wheels W′W′ are attached to the lower ends of these frames. There are corresponding wheels on the other side. The case of the declination-axis is poised at the place where these wheels come, so as to allow them to pass on the axis itself. By this arrangement, in almost every position of the telescope, one pair of wheels W′W′ bear on the declination-axis and relieve the pivots of a part of the lateral pressure, as do the wheels W W from the vertical pressure of the axis. The instrument is clamped by turning the rod K, and the slow motion in declination is given by moving the rod H, which turns the screw SS, acting on the interior triangular upright seen in the plate. T is the case containing the clockwork which communicates azimuthal motion to the instrument. *t n x* are rods by means of which the clock may be set going or stopped, regulated, connected with, or disconnected from, the instrument. By turning *t* the clock is set in motion, or regulated; *x* serves to connect it with the instrument. All these operations may be performed by the observer in his chair, in most positions of the instrument; *y* is the clock-weight, weighing about 30 lbs. The railing round the pier is for the purpose of assisting the observer in moving himself about when lying on his chair.

Having gone through those parts of the instrument which belong to it as an equatorial, we shall proceed to describe its structure as a heliometer. The half object-glasses are set on strong brass plates, which slide in grooves. They are moved by screws, which, by the intervention of cog-wheels, may be turned by turning a pair of rods which pass down the interior of the telescope-tube. F is the handle of one of these rods, B is the micrometer-head of one of the screws, which marks fractional parts of an interior scale for measuring the separation of the centres of the half object-glasses, a similar apparatus being attached to the other half object-glass. To obviate the inconveniences of referring to these exterior scales after every measurement, which, of course, involves either the observer's climbing up to them, or else the lowering of the object-end of the telescope, another scale is placed behind the object-glass, in the interior of the tube, which scale is read by long microscopes. The requisite illumination for rendering the scale visible is produced by the action of a galvanic stream on a platinum wire. The galvanic battery is placed in an apartment below. NN are the connecting wires. One of the wires passes through the box containing the polar axis; it is then conducted along the declination-axis into the tube of the telescope, where its course is marked in the engraving by a white dotted line. Contact with the platinum wire is made and broken at pleasure by a very simple mechanism, by means of a string, one end of which is close to the observer's hand. This mode of illumination answers perfectly, and a battery of Smee's construction has been found most convenient. The one actually employed has ten sets of small plates, which, plunged into a mixture of 16 parts of water to 1 of sulphuric acid, produces a sufficiently brilliant and enduring light. There is a peculiarity about the movement of the half object-glasses, which may here be noticed. In former constructions the movement takes place at right angles to the axis of the telescope; in this instrument it is in a circle of which the radius is the focal length of the object-glass. The advantage thus gained is that the images formed by both segments are always equally distinct; whereas, in the former constructions, one or other must appear out of focus, an objection of some importance when the separation of the segments is great.

The telescope-tube rests on two well-turned steel collars, at the extremity of a massive cradle, C, which extends about two-thirds of its length. D is the position-circle, and the telescope is turned round on the collars by the handles *h h*; near the eye-end *f f* are the clamping and slow-motion screws of the position-circle.

The instrument was made by Messrs. A. and G. Repsold, of Hamburg, at the expense of the Radcliffe Trustees. The object-glass is by Merz of Munich. Its focal length is 10 ft. 6 in., and the diameter is 7½ in.

THE CHATHAM OBSERVATORY.

Amongst the public observatories, we must not pass by without notice a small observatory erected at Chatham within the fortifications, for the instruction of the cadets sent from Woolwich as candidates for the Royal Engineers. Captain (now Sir William) Denison, who proposed that a course of practical observing should be added to the studies of the engineer officers, provided at his own expense, and lent to the establishment an altitude and azimuth instrument and a portable transit. To these instruments was afterwards added, by the advice of General Pasley, an 18 in. repeating circle. There is also an equatorial instrument, whose telescope (by Jones) is of 44 in. full length, and 2¾ in. aperture. It was mounted on its pier in the new observatory by Messrs. Troughton and Simms. These instruments were at first placed temporarily in some wooden huts, but a well-planned observatory was built for them in 1841, and since that time it has been used systematically as a place for instruction in practical astronomy.

It will be fresh in the recollection of some of our readers that a corps of engineer officers, previously instructed at Greenwich, were sent out under Colonel Estcourt to measure for the British Government the boundary-line of the British territories and those of the United States. The way in which they performed this service excited the admiration of those cognizant of these matters; and to the general public it will be interesting to be informed that the officers of this efficient arm of the military service have now the opportunity of being instructed in a branch of study which they are, from their education and general intelligence, so capable of employing with advantage to the honour and welfare of their country.

We have now completed the description of the public observatories that fall within the limits of an ordinary ride for a visitor to the great metropolis. Other public observatories in the British Islands, that do not lie within our range, are those of Edinburgh, Glasgow, Dublin, Armagh, Durham, Portsmouth, and Liverpool, which we are obliged to pass by with this bare mention of their names.

We now proceed to give brief descriptions of the private observatories belonging to gentlemen residing within the prescribed limits, and under this head we are enabled, through the kindness and prompt information afforded by their proprietors, to offer accounts of the following: viz. of those of—

Sir James South, on the Campden Hill, Kensington.
George Bishop, Esq., in the Regent's Park, London.
W. Simms, Esq., at Carshalton.
A. K. Barclay, Esq., at Bury Hill, near Dorking.
S. C. Whitbread, Esq., at Cardington, near Bedford.
J. Drew, Esq., at Southampton.
Dr. Lee, at Hartwell, near Aylesbury.
The Rev. C. Lowndes, at Hartwell Rectory.

The Rev. J. B. Reade, at Stone Vicarage, near Aylesbury.
T. Dell, Esq., at Aylesbury.
R. Snow, Esq., at Ashurst, near Mickelham, in Kent.
C. May, Esq., at Ipswich.
The Rev. John Slatter, at Rose Hill, near Oxford.
The Rev. W. R. Dawes, at Wateringbury, near Maidstone.

THE OBSERVATORY OF SIR JAMES SOUTH, F.R.S.L. AND E.; F.L.S.; HON. M.R.I.A.; ETC., ETC., ETC.

The observatory of Sir James South is of European fame, and may be considered in some degree as the parent of all the rest that we shall have occasion to describe. Its munificent owner devoted his time and part of his fortune to the advancement of astronomy, at a time when it was not the fashionable science that it has since become, and he was one of the founders of that most efficient and useful of modern scientific institutions, the Royal Astronomical Society. His observations made at the time of his residence in Blackman Street are inseparably connected with the astronomy of that period; a period remarkable for the zeal with which the science began to be prosecuted in this country by men whose names are now of world-wide celebrity.

Of the observations in Blackman Street, the most remarkable are those of a catalogue of 380 double stars, which were made in the years 1821 to 1823, in conjunction with Sir John Herschel. The account of these observations, and of their results, published in the *Philosophical Transactions* for 1825, is accompanied by an elaborate description of the 5-ft. and 7-ft. equatorials with which they were made; and the visitor of Sir James South's observatory, on the Campden Hill, will be interested to see one of those instruments still mounted and in excellent condition.

The other working instruments of the observatory on the Campden Hill are a 7-ft. transit instrument, and a 4-ft. transit-circle. Of the former an elaborate account has been given by Sir James in the *Philosophical Transactions* for 1826, in a paper containing the comparisons of some observed right ascensions of the sun with the best modern tables. The transit-circle is celebrated as having formerly belonged to Mr. Groombridge, and as being the instrument with which the observations were made for the formation of the catalogue of circumpolar stars which bears his name.

Of this admirable instrument, descriptions, illustrated by engravings, will be found in *Rees's Cyclopædia* and in the second volume of Pearson's *Introduction to Astronomy;* and an account of it, extracted from the former of these works, is prefixed to *Groombridge's Catalogue,* as edited by Mr. Airy.

The range of observing-rooms is terminated by an apartment surmounted by a dome, in which was formerly mounted a large equatorial. This instrument has been dismounted, and the dome is at present not used, excepting as a receptacle for telescopes and other instruments of a miscellaneous character.

THE OBSERVATORY OF GEORGE BISHOP, ESQ., F.R.S.; F.R.A.S. AND TREASURER; ETC., ETC., ETC.

This observatory, though of more recent date than that of Sir James South, has attained in a short space of time an enviable distinction for its proprietor and for his talented coadjutor, Mr. Hind, by the series of brilliant discoveries that have been made, and for the really valuable and laborious, yet less known, works which have been performed at it. A brief account of its erection and a description of the Equatorial chiefly used in it, will properly precede our account of the discoveries.

It was erected in the year 1837, in the grounds to the south-west of Mr. Bishop's residence, South Villa, in the Inner Circle, Regent's Park, near the Royal Botanic Society's Gardens.

The principal instrument is an equatorial telescope, equipped on the plan known as the English mounting; the polar axis is 13 ft. 8 in. long and 9½ in. broad at the widest part near the centre of its length, tapering off to about 7½ in. at the extremities. The solar focus of the telescope is 10 ft. 10 in., and the clear aperture of the object-glass 7 in. The instrument was wholly constructed by the present G. Dollond, Esq., of St. Paul's Church Yard. The circles are 3 ft. in diameter; the hour-circle reads to single seconds of time by verniers, and the declination-circle to 10″ of arc. The instrument is driven by clock-work motion, this part of the machinery in particular being very elaborately worked.

The stone pier supporting the upper end of the polar axis of the equatorial weighs 3½ tons, and that at the lower end 2½ tons. The clock-movement is fixed on a stone pedestal perfectly isolated from the floor, as is also the sidereal clock.

The micrometers consist of—

1. A position-wire micrometer.
2. A double-refracting crystal micrometer.
3. A divided eye-glass micrometer.
4. An annular micrometer.

The telescope is provided with magnifying powers up to 1200. η Coronæ was separated in June last with a power of 800, which may give an idea of the optical and defining capacity of the instrument.

The dome is of wood, with stout iron braces, and is not exactly hemispherical, but tapers upwards to a point (for the sake of ornament). It revolves on wheels working in a live-curb, and its performance is excellent. It is impelled by a lever, which acts on iron arms placed at equal distances (about 2 ft.) round the inner border. The machinery was finally adjusted by Mr. Penn, of Greenwich. When in good order it may be turned more than half-round at one effort.

The observatory consists of a circular equatorial room surmounted by the dome, and an arm extending westward, which forms the anti-room and contains the altitude and azimuth instrument now used for keeping the time, various micrometers, a sidereal clock, a chronometer, and general furniture. Gas illumination is used in the observatory for the transit-observations.

A mahogany revolving chair is fixed in the equatorial room, which is very convenient for observing objects near the zenith, or for delicate observations in general. This chair gained the medal of the Society of Arts and the money prize in addition.

The longitude of the observatory is 0m. 37s.·1 W.; the latitude, 51° 31′ 29″·8 N.

In the year 1839 Mr. Bishop was fortunate in securing the services of the Rev. W. R. Dawes, a gentleman previously well known for his observations of double stars made at an observatory of his own, at Ormskirk.

During the attachment of Mr. Dawes to the observatory which continued till the beginning of the year 1844, the observations consisted principally of double-star measurements. The results have not yet been published, but the volume containing them has nearly passed through the press, and its publication may be expected almost immediately.

In the year 1844 Mr. Dawes resigned, and was succeeded by J. R. Hind, Esq., then an assistant in the magnetical department of the Royal Observatory, Greenwich, where he had already distinguished himself by the zeal and ability with which, in addition to his ordinary duties, which were severe, he devoted himself to the labour of observing comets and calculating the elements of their orbits.

Almost from the time of Mr. Hind's appointment the observations took that character for which his talents fitted him, viz., the search of the heavens for new comets and planets, and the scrutiny of such stars as seemed to offer any physical peculiarities of colour, variability, &c.

Mr. Bishop and Mr. Hind were almost immediately rewarded by discoveries of comets. Three of these bodies were discovered in the years 1846 and 1847, of which the latter became visible at noonday, when near its perihelion, and for which the King of Denmark's gold medal was awarded.

The other branch of research was still more successful, viz., the search after small planets lying between Mars and Jupiter. It may be desirable to say a few words in this place on the nature of the search that must be instituted for these bodies, so as to offer any reasonable probability of ultimate success. They are in general very faint objects, varying from about the 8th to the 11th magnitude, and differing by no physical characteristic from the small stars near them. There are then only two means of detecting them, viz., 1st. By observing previously all stars that lie within those limits of the heavens within which they may be reasonably expected, that is, by observing and mapping all the stars for several degrees on each side of the ecliptic; or, 2ndly, by observing on several successive nights all the stars down to the 11th magnitude in certain spaces of the heavens, pricking off immediately their places on maps previously prepared, and then, after re-observation of them, noting whether any one of them seems to have had any motion in the interval, this being the only planetary characteristic observable. The former of these methods was determined on by Mr. Bishop, who undertook, in conjunction with Mr. Hind, the formation of ecliptic charts of stars of all magnitudes down to the 11th. This great and important work has been steadily prosecuted ever since; only one chart has, however, yet been published, owing to the severe illness of Mr. Hind, at one period of the work—an illness occasioned chiefly by his unremitting labours.

In the course of these researches three small planets have been discovered, viz., Iris, on August 13, 1847; Flora, on October 18, 1847; and Victoria, on September 13, 1850. For the discoveries of Iris and Flora a prize on the Lalande foundation was received from the Academy of Sciences, at Paris, in April, 1850. It will be readily seen from the preceding brief explanation that such discoveries are not accidental, but are the result of a sagacious plan of observation carried out with most severe labour and unwearied patience.

Amongst Mr. Hind's star discoveries may be mentioned a star in Ophiuchus, of very great variability, which had never been previously observed. This star after its detection became of such brightness that it was visible with the naked eye, and it has since faded away and become so faint that the writer of the present article remembers to have had great difficulty in observing it recently with an instrument of considerable optical power.

Mr. Hind has paid great attention to the subject of variable stars, a very necessary branch of sidereal astronomy at the present time, and has come to the following remarkable conclusion concerning them, that a very great proportion of them are red or orange when about their maximum, and that many have a clouded nebulous appearance when at their minimum of brightness. These facts have, it is believed, never been observed before, and are well worth confirming.

In closing our account of this observatory, we are sure the intelligent visitor will cordially join us in wishing health and long life to Mr. Bishop, its munificent founder and proprietor, and to Mr. Hind, his talented and zealous coadjutor.

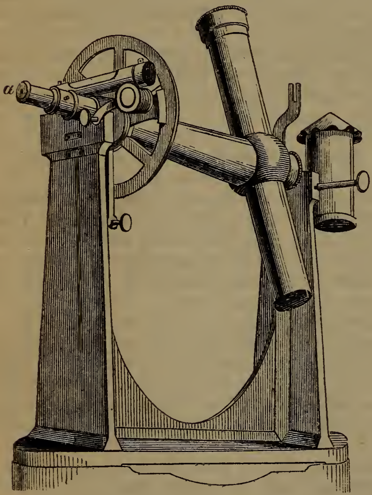
THE OBSERVATORY OF W. SIMMS, ESQ., F.R.A.S.

Mr. Simms, the eminent optician of Fleet Street, has adorned the grounds of his country residence at Carshalton, in Surrey, with their most appropriate ornament, an observatory furnished with instruments chiefly of his own construction. The facilities afforded by the numerous railroads that run in every direction out of London, enable the merchant, the artist, and the professional man, without any interruption to the ordinary attendance on business, to enjoy the pleasures of the country, and in the short intervals of quiet and repose, to devote themselves to such favourite studies as are the recreations of the energetic mind after the harassing toil of routine business. Mr. Simms has wisely employed his opportunities and his leisure in constructing an observatory to afford him the means of practically pursuing the science of astronomy to which his tastes have always inclined him.

His observatory consists of a single apartment 16 ft. long and nearly 8 ft. wide, and is formed in the most simple and economical manner possible, the sides being merely a framework of deal covered with sheets of asphalt felt. The roof is nearly flat, being only sufficiently inclined towards one side to insure dryness. Half the length of the apartment is permanently covered over and serves for a computing room, the other half where the instruments are placed can be uncovered by running off a shutter upon the covered part; six rollers fixed to the under side of the shutter and running upon two iron rails make this a very easy matter.

The equipments consist of a clock, a transit-instrument, and an equatorial.

The clock is an old one by Brockbanks, a celebrated maker of his day. The pendulum is peculiar; it is, in fact, a large mercurial thermometer, the bulb of which forms the pendulum-bob, and the compensation is effected by the rise and fall of the mercury within the tubes. This pendulum was invented and made by the late Edward Troughton, to whom the clock originally belonged.



THE CARSHALTON TRANSIT.

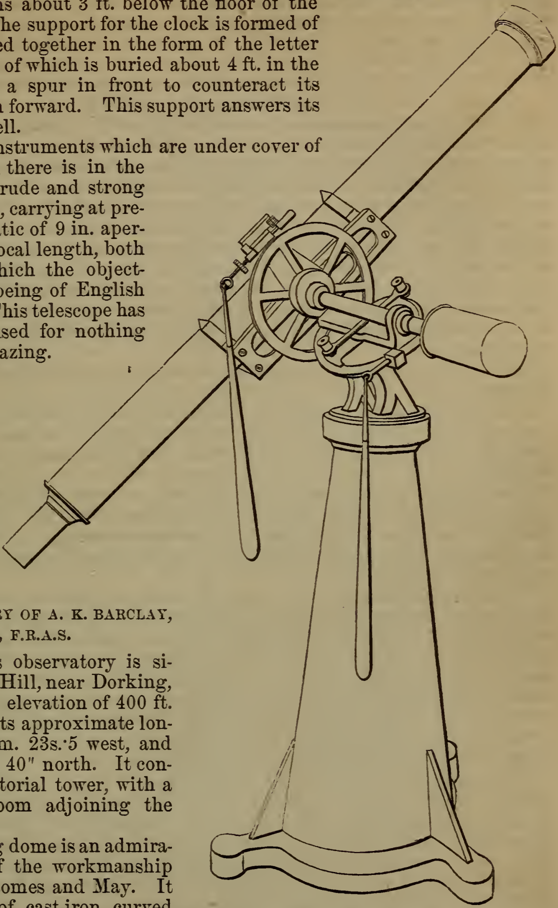
The transit-instrument is of the kind described by Captain W. H. Smyth, in his prolegomena to the Bedford Catalogue, as the chamber transit. Indeed it is the identical instrument of which a figure is there given. The aperture of the object-glass is 1·6 in., and the focal length 18 in. The place of the observer is at one of the pivots in which the diaphragm and eye-piece are inserted as at *a*, in the accompanying figure, the illumination of the field being effected through the pivot at the opposite end of the axis. It will be observed that the advantage of this construction consists in the observer not having to change his position whatever may be the altitude of the object he is observing. The purpose of this instrument, as is obvious from its dimensions, is merely to keep the rate of the clock.

The equatorial, of which a figure is given, is of the Frauenhofer form; it is without a clock-motion, but in all other respects is fitted up in the most complete manner. The telescope is an achromatic of 42 in. focal length, and 3¼ in. aperture, having a finder, the usual apparatus for illuminating the field, a position-micrometer, and a powerful battery of negative eye-pieces. It was intended with this instrument to make some attempts upon the double stars, but its capabilities in regard to light and power are hardly equal to such a task, and it is about to be replaced by an instrument carrying a telescope of 4 in. aperture, and 5 ft. focal length, for which there will be just room enough in the observatory.

The piers are of brick, built in cement, and have their foundations about 3 ft. below the floor of the observatory. The support for the clock is formed of two deals screwed together in the form of the letter T, the lower end of which is buried about 4 ft. in the ground, having a spur in front to counteract its tendency to lean forward. This support answers its purpose very well.

Besides the instruments which are under cover of the observatory, there is in the open ground a rude and strong equatorial-stand, carrying at present an achromatic of 9 in. aperture and 15 ft. focal length, both the discs of which the object-glass is made being of English manufacture. This telescope has hitherto been used for nothing but mere star gazing.

MR. SIMMS'S EQUATORIAL.



THE OBSERVATORY OF A. K. BARCLAY, ESQ., F.R.A.S.

Mr. Barclay's observatory is situated on Bury Hill, near Dorking, in Surrey, at an elevation of 400 ft. above the sea; its approximate longitude being 1m. 23s.·5 west, and latitude 51° 13′ 40″ north. It consists of an equatorial tower, with a small transit-room adjoining the lower story.

The revolving dome is an admirable specimen of the workmanship of Messrs. Ransomes and May. It is constructed of cast-iron curved rafters, bolted into a trong curb of wood, filled in with $1\frac{1}{2}$ in. deal, and covered internally with thin copper. It revolves upon three balls, in very shallow cast-iron channel plates.

The transit-instrument is by Simms, and has a focal length of 42 in., the object-glass being $2\frac{3}{4}$ in. in diameter.

The clock is by Dent, with steel pendulum-rod and turned iron mercury jar.

The equatorial telescope, the declination-axis of which is 26 ft. above the ground level, is mounted on the German construction, having a short polar axis and small circles. It stands upon a stone pedestal supported by a brick pier, built hollow and filled with dry sand to prevent vibration. The focal length is 8 ft., and the object-glass 5·9 in. in diameter. The clock-work movement is entirely included in the hour-circle, permitting the requisite adjustment to bring an object to the centre of the field. It has an escapement beating eight times in the second, and the pulsations are not perceptible even under high power.

THE OBSERVATORY OF S. C. WHITBREAD, ESQ., F.R.A.S., PRESIDENT OF THE BRITISH METEOROLOGICAL SOCIETY.

Mr. Whitbread, whose name, as well as that of Mr. Barclay, is so well known in the ranks of commerce, has devoted himself to science with that happy union of zeal and practical ability that are so characteristic of the English mind. In addition to the foundation of the observatory of which we are about to speak, he is at the head of a recent organization for advancing the science of meteorology, and has accepted the office of president of the new society that has been formed. Of this society we shall have occasion to speak in the sequel, in connexion with the various meteorological observatories that have been established on an organized plan, mainly by the exertions and instrumentality of Mr. Glaisher, of the Royal Observatory. For the present we must confine ourselves to the description of Mr. Whitbread's astronomical observatory.

There are two or three interesting circumstances which we will previously mention.

The observatory is situated at Cardington, near Bedford, in a garden belonging to Mr. Whitbread's estate, which was planted by the celebrated John Howard the Philanthropist, under whose will it has descended to the present occupier.

The sidereal clock used in the observatory is remarkable for its age and its construction. It was made about the year 1760, by Thomas Brass, of Guildford, who was an enthusiast in his profession. It is very old-fashioned in appearance, but performs admirably at the present time, and the beat is remarkably distinct.

A permanent assistant, Mr. John B. McLarin, has been engaged for conducting the observations; and this circumstance gives prospect of good and useful work. Indeed an observatory without establishment must become at length either an incumbrance or a plaything to its owner; but a little additional and permanent expense in endowment has in almost every known case been productive both of honour to the proprietor and of gain to science.

The height of the observatory above the level of the sea is 81 ft.

The principal instruments in this observatory are an equatorial, a transit circle, and an altitude and azimuth instrument.

The equatorial was made by Troughton and Simms, for the Rev. Samuel King, of Latimer, near Chesham. The instrument, in regard to its general arrangement, resembles those made by Fraunhofer. The telescope is an achromatic of 4⅛ in. clear aperture, and about 5 ft. focal length. It carries a finder, and is furnished with adjustment for focus; six negative eye-pieces, of powers varying from 47 to 410, also one of the pancratic kind; it has a position micrometer, illuminating apparatus, and all the usual appliances to fit it for the most delicate operations of sidereal astronomy.

The telescope rests in a cradle at one end of the declination-axis, and overhangs the side of the supporting frame, having free and unobstructed motion in every direction. At the opposite end of the same axis the declination-circle is fixed (this circle is of 12 in. diameter). The divisions are cut upon a band of silver to ten minutes of arc, which by two opposite verniers are subdivided to ten seconds; and these spaces are so broadly distinguished that it is quite easy, by estimation, to take a reading to half that quantity. There are microscopes for reading the verniers, with clamps for fixing, and tangent screw for giving slow motion to the telescope.

A striding level, similar in all respects to the axis-level of a transit-instrument, can be applied to cylindrical collars upon the declination-axis. This level, by which the perfect horizontality of the declination-axis is indicated, greatly facilitates the adjustment of the instrument to the meridian of the observatory, and with due correction of the line of collimation makes the instrument no indifferent substitute for the transit-instrument, in cases where so important an auxiliary is not at hand.

The polar axis is about 25 in. long; the hour circle, 12 in. diameter, is fixed near its lower end. The divisions are cut upon a band of silver to one minute, and these are subdivided by opposite verniers to single seconds of time. The edge of the circle is toothed, and has an endless screw working upon it; which screw can be turned either by hand, for the purpose of setting the telescope to any given right-ascension, or it may be connected with clock-work, when it is desired to keep the object under observation steadily in the field of the telescope, in other words, to counteract the effect of the diurnal motion of the earth. The clock is firmly fixed to the iron support of the instrument; it has a centrifugal pendulum, not unlike the governor of a steam-engine, and is altogether so arranged that its regulation and government are within reach and under the absolute control of the observer.

Of the supporting frame it is only necessary to state that it is of cast-iron, having a Y to receive the upper end of the polar axis, and a socket for the lower end, the latter having screw adjustments both for altitude and for meridional position; and that this stand is screwed firmly to the top of a pedestal.

The transit-circle was likewise made by Troughton and Simms, for the Rev. Samuel King, and is one of the diagonal kind described by Capt. Smyth, in his *Cycle of Celestial Objects,* as the chamber-transit; but it differs from that instrument in having a large and finely-graduated circle, capable of giving very exact results in altitude as well as in right ascension, thus constituting it an efficient instrument either for the regulation of the observatory clock, for determining the latitude of the place, or for obtaining the declination of any object within reach of its optical power. The telescope has an aperture of 1½ in., and a focal length of about 20 in., with several magnifying powers. In this instrument the rays do not proceed directly from the object-glass through the tube of the telescope, but are reflected by a prism placed in the centre of the axis, and thereby made to pass through one of the cylindrical pivots, forming an image beyond it; here therefore, that is, at the end of this pivot, the diaphragm and eye-piece are placed, and the observer has no occasion to change his position, whatever the zenith distance of the object may be to which the telescope is directed; for all objects are alike reflected through the pivot to an eye looking through the axis. The great convenience of this arrangement will be obvious to every one, and appreciated by those who have felt the discomfort of twisting the neck and bending the body into suitable positions for observing with the ordinary portable transit-instrument, and especially when the objects are near the zenith.

The lamp is placed upon a stand beyond the remote pivot, the light from which is made to diverge upon four segments of a large lens which project beyond the sides of the prism, and is thereby refracted and made to converge upon and illuminate the field of view.

The axis is levelled by a striding level of the usual kind, which is furnished with a scale showing single seconds of arc.

The circle is of 12 in. diameter, with divisions upon silver to 5′ of arc, read by means of two opposite verniers to 5″; it is furnished with microscopes for reading the verniers, a clamp and tangent screw, and all appropriate adjustments; the whole is mounted upon a plain stand of cast-iron.

The altitude and azimuth instrument was made by Troughton, towards the end of the last century, for the Rev. Francis Wollaston, who gave a description of it in his *Fasciculus Astronomicus,* which was published in the year 1800.

It subsequently became the property of the late Admiral Shirreff, from whose representatives it was purchased by its present proprietor.

This instrument may be taken as the type of the modern altitude and azimuth instrument; and considering that it was the first of the kind made by Troughton, it is surprising that so little was left to be done in the way of subsequent improvement.

The base is a strong tripod, having adjusting screws for levelling the instrument, and the azimuth-axis is firmly screwed into its centre; upon this tripod the azimuth circle, of 12 in. diameter, is placed. The divisions are cut upon the brass (for the custom of inlaying a band of one of the precious metals was not then introduced), into spaces of 10′ of arc; these spaces are subdivided to 10″, by two opposite verniers fixed to a circular plate which revolves upon the azimuth-axis; upon this revolving or vernier plate two columns are erected for supporting the superior parts of the instrument; and in order to guard against the possibility of twisting in these important parts (for such twisting would be fatal to all azimuthal determinations), the columns and the external cone of the azimuth-axis are bound together by a strong connecting frame.

For the purpose of giving greater length to the transit-axis, the columns are made to lean outwards from the vernier-plate upon which they are based; and upon the top of them the Ys for receiving the pivots of the transit-axis are placed, one of which can be adjusted vertically for the purpose of levelling.

The focal length of the telescope is about 20 in., with an aperture of about 1¾ in. It has five vertical and as many horizontal wires in its focus, with magnifying powers of about 35 or 40 times.

The altitude-circle is double, with connecting pillars between them; it is of 12 in. diameter, and is read to single seconds by means of two micrometer-microscopes, which are supported by an arm firmly secured to one of the columns.

There are two spirit-levels to this instrument, one of which is permanently fixed upon the telescope in the direction of its length, and the other is for the purpose of levelling the transit axis.

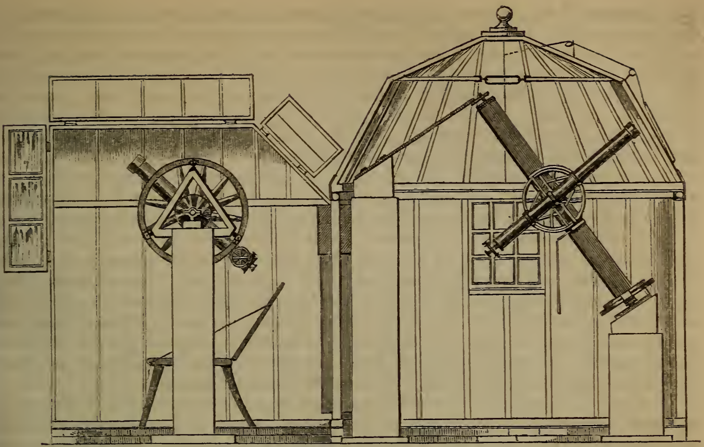
Both circles are fitted with clamps and tangent screws, and are in all respects completed as in modern instruments.

THE OBSERVATORY OF JOHN DREW, ESQ., F.R.A.S.

This observatory is situated at Southampton, at Mr. Drew's residence, Winsor Terrace, Cumberland Place. The distance from London might seem to place it without our limits; but by the magic agency of the railroad, Southampton is brought within reasonable visiting distance; and we have an object in view in showing that the public are benefited by the liberality and spirit of Mr. Drew, in giving correct time to this important port, when no public means have been resorted to for supplying it. Mr. Drew is well known to men of science as a zealous cultivator of astronomy. He is the author of a *Manual of Astronomy*, of which he is, we hear, preparing a new edition, and of various papers on meteorology, in the *Civil Engineer and Architect's Journal*.

The observatory consists of an equatorial-room and a transit-room; the former is 9 ft. in diameter, and is adapted to a 5 ft. achromatic by Dollond, mounted with a polar axis in the usual manner. The right-ascension and declination circles are 15 in. in diameter; and the telescope is furnished with a position wire micrometer and a rock crystal micrometer. The astronomical powers, of which there are eight, vary from 26 to 410, and admit of being increased by the insertion of a concave lens a few inches in advance of the focus of the object-glass.

In the transit-room is a transit-circle by Jones, 30 in. in diameter. The



SECTIONAL VIEW OF MR. DREW'S OBSERVATORY.

telescope is 42 in. focal length, with an object-glass 3¼ in. in diameter. The axis moves on agate bearings. In the focus of the object-glass are five vertical wires, one fixed horizontal wire, and another moveable in altitude, by means of a micrometer-screw. The whole is mounted on stone piers. To the eastern pier are attached three microscopes, for reading off zenith distances on the circle. The nadir-point is found by observing the image of the wires reflected from mercury; for which purpose an eye-piece with a single lens is furnished with a perforated mirror, by which the light, admitted laterally, is reflected down the tube.

Outside the observatory a solid piece of brickwork is erected for the purpose of carrying a 20 in. collimating telescope, which is never removed; by means of this instrument the horizontal-point may be determined; and as there is no distant object visible in the horizon from the observatory, the wires of the collimator serve, when once adjusted, as a permanent meridian mark.

The object which the observatory is now answering is the determination of Greenwich time from the local time at the port. The chronometers of the various steamers which leave Southampton are under the care of Mr. Stebbing, optician, and his clock is regulated, from time to time, by comparison with Mr. Drew's. The observatory was originally built for the purpose of cultivating practical astronomy, and is ready for any work within the range of the instruments.

An account more extended than the present may be found in the Royal Astronomical Society's *Memoirs*, vol. x., No. 3, p. 68; and a plan and section of it may be seen at the Society's rooms, Somerset House.

The latitude and longitude of the observatory, as determined by triangulation from the Ordnance Map Office, Southampton, are as follows:—

Latitude, 50° 54′ 34″ north; longitude, 1° 24′ 25″·8 west.

THE OBSERVATORY OF JOHN LEE, ESQ., LL.D., F.R.S., F.R.A.S., ETC.

Dr. Lee has been well known for many years as one of the warmest friends and most munificent patrons of science. With large means and the magnificent mansion of Hartwell House at his disposal, he has always used every opportunity that has been presented to him for employing his advantages in the furtherance and extension of physical research, and especially of astronomy, the only subject which now falls within our province. For many years he acted as Treasurer to the Royal Astronomical and Numismatic Societies, and is never absent from his post as one of the standing members of the council of the former body. To the Astronomical Society he has made many valuable presents, especially in the presentation of the advowsons of two valuable livings, viz., that of the vicarage of Stone, near Aylesbury, and that of the rectory of Hartwell, belonging to his own estate.

An account of Hartwell House, which is celebrated as being the place of residence of Louis XVIII. and his court during his exile from France, will be found in Lipscombe's History of the County of Buckinghamshire, and in other works; and our necessarily confined limits forbid anything more than a mention of it in connexion with the observatory. We cannot, however, refrain from a passing mention of the well-arranged museum of objects of natural history, and antiquities, which Dr. Lee has formed with immense research and care since his accession to the estate. The objects, well-arranged and classified, occupy the whole of one very large room, which was formerly the ball-room of the mansion. There is also a library of upwards of 20,000 volumes in every department of literature, admirably classified and arranged.

In the building of the observatory regard was necessarily paid to the architectural character of the mansion, and, after a great deal of consideration, it was determined to connect it with the main building at its south-eastern corner, and with mouldings and architectural ornaments, harmonizing as much as possible with the mansion. For convenience of access, a communicating door from the noble library leads immediately to it with the simple intervention of a very small furnished ante-room. The observatory consists of two apartments, the transit-room, which is first entered from the library, and the dome for the Bedford equatorial, to which the approach is by a small flight of steps at the eastern end of the transit-room. The latter was built several years after the former, when, on the removal of Captain Smyth from Bedford, an opportunity was presented to Dr. Lee of purchasing the excellent equatorial instrument which was made so good use of by that excellent observer.

We will first describe the *Transit-Room* and *Transit-Instrument*:—

The apartment is a small oblong room of a hexagonal appearance, from having the corners walled or boarded up. The vertical meridian openings are ordinary glazed window frames, and the roof being flat, the shutters that go across it turn back on simple hinges. The transit-instrument was made by Mr. Thomas Jones, and rests on two solid piers of oolite cut from a single block, the foundation being a very solid brick pier, which is well worthy of inspection. The focal length of the transit telescope is 5 ft., and the aperture of the object-glass rather more than 3½ in. The object-glass is not a particularly good one, and it was originally intended that another should be supplied. The length of the axis is about 2½ ft. from pivot to pivot, and the diameter of each pivot is rather more than 1 in. The eye-piece has five vertical or transit-wires, but is not furnished with a micrometer. The setting circles on the eye-end are as usual furnished with levels.

There are two near meridian marks, one to the north and one to the south, constructed and fixed according to the principles explained in Captain Smyth's *Cycle*, vol. i. p. 331. The most important part of their construction is the intervention of a lens of long focus, which is firmly fixed in the direct line between the centre of the axis and the mark, so as to cause the rays from the mark, after passing through it, to become parallel, and to prevent any necessity for change of the solar focus of the transit-telescope.

The transit-clock is an excellent one by Vulliamy.

The *Dome* for the equatorial is 15 ft. in diameter in the inside, the height of the wall above the flooring being 7 ft. The revolving part is covered with sheet copper; it is hemispherical, and runs easily upon three balls resting in concave channels. The shutter is ingenious and conveniently arranged; it is in fact the half of a spherical lune of sheet copper, included between two vertical circles whose distance where they meet the dome curb is about 3 ft. This revolving freely round an axis at the top of the dome, is made to move by means of a rack and pinion, on the outside of the surface of the dome, so as to close the opening or to leave it exposed.

The foundations for the upper and lower pivots of the instrument are two very solid brick piers of a pyramidal form, nearly 10 ft. in height, resting upon concrete; a third pier is built up between these for the security of the floors of the dome. In the subterraneous passages great attention has been paid to secure perfect ventilation, and the piers and side-walls are always thoroughly dry.

The instrument itself formerly belonged to Captain Smyth, as has been before mentioned, and it is fully described in the first volume of his *Cycle*, as well as in vol. iv. of the *Memoirs of the Royal Astronomical Society*. A brief description will therefore suffice in this place.

The telescope is of 8½ ft. focal length, with a double object-glass of very nearly 6 in. clear aperture by Tulley. The flint-glass portion was made from a pure homogeneous disc purchased at Paris, in 1828, by Sir James South, who disposed of it afterwards to Captain Smyth. From the long and severe experience of its qualities by Captain Smyth, he has come to the conclusion that the telescope is a very fine one for its size, bearing the usual test objects remarkably well.

The polar axis is nearly 14 ft. in length, and consists of four mitred slabs of well-seasoned mahogany, 10 in. square in the middle and 8 in. at the ends, strongly joined together by screws that pass through them to interior brass squares; at its extremities are large bell-metal pivots. For the support of the pivots two stone piers are built upon the brick foundations before-mentioned, of which the northern one rises to the height of 10 ft. above the floor, and carries a cast-iron frame with the requisite adjusting apparatus for the reception of the Y. The lower pivot turns in a polished metal centre imbedded in the stone-pier. The telescope is carried by a stout axle through a hollow centre of bell-metal, firmly secured by flanges, and is attached by three broad clasps to a brass trapezium. The declination and hour circles are each 3 ft. in diameter, and are read by verniers to 10″. Clock-work is attached to the instrument for giving a diurnal motion to the telescope. This was presented originally to Captain Smyth by the Rev. R. Sheepshanks. A train of wheels moved by a weight beneath the flooring are made to carry a governor similar to that of a steam-engine, with revolving balls. It admits of very easy adjustment to time, and is very readily connected or disconnected with the instrument.

In the year 1836 Dr. Lee engaged as his observer Mr. James Epps, at that time Assistant Secretary of the Astronomical Society, but this gentleman died after a residence with him of only two years. He afterwards engaged Mr. John Glaisher, formerly assistant at the Cambridge Observatory, who was residing at that period at Stone for the benefit of his health, but he died before any regular or continuous observations had been undertaken.

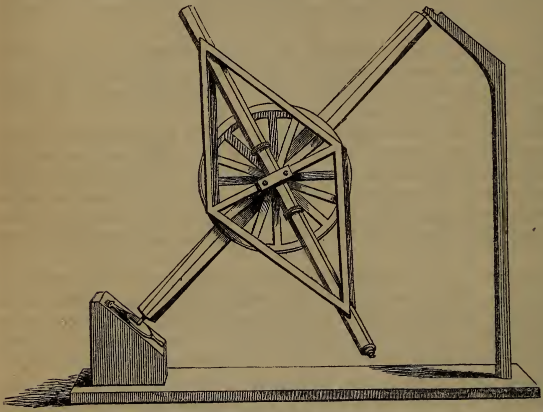
Since that time no regular observer has been employed, but Captain Smyth has, at various visits, remeasured several of the double stars of his *Cycle*, and is, we understand, at present engaged in reducing and printing (for private circulation) the results of his observations.

THE OBSERVATORY OF THE REV. C. LOWNDES, F.R.A.S., AT HARTWELL RECTORY.

The observatory is a modern brick building upon a solid formation of concrete. It contains a transit-instrument and a sidereal clock. The former was constructed expressly for the Rev. C. Lowndes, by Mr. Slater, of No. 4, Somers Place West, New North Road; the diameter of the object-glass being 4·2 in., and the focal length 6 ft. It is supported between two piers of Caen stone.

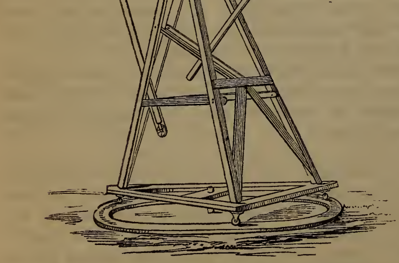
The clock is attached to a stone pedestal in the south-west corner of the building. It has a mercurial pendulum, and is, in all respects, an excellent specimen of Mr. Dent's workmanship. At present Mr. Lowndes has only a transit-room, but he proposes shortly to add an equatorial room, in which will be mounted a large telescope, which Mr. Slater is now constructing. Until this room is built Mr. Lowndes makes use of an equatorial ladder, a description of which is given by Captain Smyth in his excellent work the *Celestial Cycle.*

THE OBSERVATORY OF THE REV. J. B. READE, F.R.A.S., AT STONE VICARAGE.



PROPOSED MOUNTING OF MR. READE'S EQUATORIAL.

The observatory at Stone, near Aylesbury, has recently been erected by the Rev. J. B. Reade upon the vicarage lawn. It is an elegant Grecian building, consisting of a transit-room and a tower for the equatorial. The transit-instrument is supported on solid piers of Bath stone. The object-glass, 4¼ in. in diameter, is an interesting specimen of the skill of Mr. Peter Dollond, and the solid brass-work mounting is equally creditable to Mr. Barrow, of Oxenden Street, London. The sidereal clock in the transit-room is by Dent.



MOUNTING OF MR. READE'S 12-FT. TELESCOPE.

The object-glass of the equatorial, 7½ in. in diameter and 12 ft. in focal length, is by Newman of York. The greatest care was taken in its construction, and it well repays the large amount of labour both of calculating and grinding the proper curves. It has been carefully examined by several astronomers, who give it a very high character. This fine instrument is at present mounted on a Varley's stand, to which Mr. Reade has added some very convenient adjustments for its motion, both in altitude and azimuth; but ere long it will be placed in the tower of the observatory, on a very firm equatorial mounting, made by the village carpenter, Mr. Carter, under the superintendence of Mr. Gravatt, the iron-work, &c., being prepared by Mr. Donkin. The dome of the tower was formerly at Bedford, and will always be an interesting relic to those who can appreciate Captain Smyth's Bedford Catalogue.

THE OBSERVATORY OF THOMAS DELL, ESQ. F.R.A.S.

This observatory, the last on our list of what may be called the Aylesbury Observatories, is situated in the town of Aylesbury, on the premises of a relative of its owner. Though it is on a small scale, consisting of a very small room containing a small transit, yet there is no observatory of all those which we have described, on which the true astronomer will look with more pleasure as an interesting specimen of true zeal for science shown under difficulties of position and circumstances, and of the way in which very useful results may be compassed by comparatively trifling means. Mr. Dell is perfectly able, with this small transit-instrument, judiciously mounted, to give the time to the town of Aylesbury, and, if he should find leisure for much work, to observe a catalogue of stars in right-ascension, with an accuracy equal, pretty nearly, to that which is attained by far more costly instruments. We will therefore offer no apology for giving an account of his plan of building his observatory and mounting his transit, which may offer useful hints to other zealous persons similarly situated.

The building consists of five frames of oak filled up with deal boarding for the walls and roof; these all screw together so that the whole erection may be taken to pieces and again set up, on a foundation prepared for it, in a few hours. The foundations on which the walls rest are about a foot deep, and of brickwork laid in cement, which is carried high enough above the surface of the ground to allow a free current of air beneath the floor. The floor is laid on joists, resting upon the brickwork, and is of course quite clear of the piers which carry the transit-instrument and clock. There is a glazed window at each end, and a corresponding opening in the whole length of the roof in the direction of the meridian. The roof is covered with canvas well-painted, and while wet sprinkled with fine sand and again painted. This is thrown back with the shutter when in use, and when closed, it covers the whole roof, and is fastened at the side, so that it is completely weather-proof. The dimensions of the room on the inside are 7 ft. 6 in. long, by 5 ft. 6 in. wide, and 6 ft. in height. In order to have room in this small space, the transit-pier is not placed in the middle of the room, but very much on one side. It should be added that the whole of the interior is lined with green baize.

The transit instrument is 33·5 in. focal length, and 2·7 in. aperture, and is a very fine one. There are seven vertical wires in the diaphragm and two horizontal. It has a diagonal eye-piece, and three powers, ranging from 84 to 130. It is placed on a pier of brickwork 6 ft. deep and up to the surface of the ground 5 ft. square; above ground it is 18 in. square. The instrument is remarkably steady, as it is very rarely that the level needs the slightest alteration.

The other instruments are a clock, standing on a pier in the south-west corner, a 45-in. achromatic, by Tulley, for occasional observation, a barometer, dry and wet-bulb thermometers, maximum and minimum self-registering thermometers, and a rain gauge.

The position of the observatory is in north lat., 51° 48′ 55″·9; west long., 3m. 16s.·8; and about 284 ft. above the sea level.

THE OBSERVATORY OF ROBERT SNOW, ESQ., F.R.A.S.

This observatory, which was planned by Mr. Snow, and built in 1834, is situated at Ashurst, in Kent, in longitude 1m. 10s. west of Greenwich, and in north latitude 51° 15′ 58″, the former being determined by transport of chronometers between Ashurst and Lord (then Mr.) Wrottesley's* observatory at Blackheath ; the latter by observations with a portable 20 in. transit placed in the prime vertical. Its elevation is 550 ft. above the level of the sea. Its general construction, which deserves notice for its convenience and simplicity, will be well understood by our engraving. It is a small building in the form of a parallelogram 24 ft. by 10 ft. The walls are of brick 14 in. in thickness, painted of a slate colour. The soil on which the observatory stands is a rocky gravel, and the neighbourhood is hilly, though there are no heights that materially obstruct the horizon in any direction.

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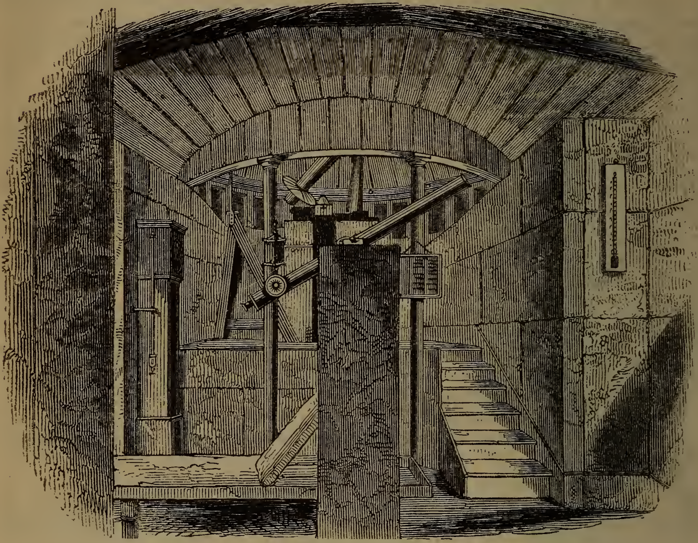
* Lord Wrottesley, on coming to the title, removed to his seat at Wrottesley, near Wolverhampton, where he has an observatory well equipped with excellent instruments, especially with a large equatorial, formerly belonging to E. B. Beaumont, Esq.



MR. SNOW'S OBSERVATORY.

The entrance to the observatory is by a door at its north end, which opens into a passage or ante-room useful for keeping books and apparatus.

This ante-room communicates directly with the transit room, and the latter communicates, by means of a flight of steps, with a rotating dome containing an equatorial. We will proceed to describe each of the instruments.

The *Transit Instrument* by Simms is of 3½ ft. focal length, and 2¾ in. aperture. The length of the axis is 18 in. from shoulder to shoulder. The piers are erected with great solidity from some depth in the gravel beneath, and the lower parts of them are cut away for several inches to allow convenient space for the observer. The shutter openings are continuous from horizon to horizon, and consist of north and south windows, and shutters in the sloping roof.

Adequate provision is made for protection of the instrument from the sun's rays.

There are seven fixed vertical wires, and one wire moveable by a micrometer in the principal focus of the telescope. The error of collimation is obtained by means of a fixed mark on a stone pillar erected on a hill to the north about three-quarters of a mile distant. Numerical corrections are applied for the error of collimation, as well as for the errors of level and azimuth; and imperfect transits are rigorously reduced to the mean of wires.

The transit-clock (which can be seen and heard from every part of the observatory) was made by Molyneux, father to the present well-known clock and chronometer maker; it has the usual dead-beat escapement and mercurial pendulum.

The *Equatorial* is by Simms. The object-glass of the telescope has 3·9 in. clear aperture and 5 ft. focal length, and has given its owner every satisfaction. It was originally ground for the observatory at Alabama. The mounting of the instrument is that generally known as the Fraunhofer mounting, and is very solid. It has some peculiarities, among which may be mentioned that the polar axis is a bold conical brass tube, long enough to admit both the declination-axis and the telescope-counterpoise *withinside* of the northern pivot and its support. The support of the northern pivot is also a conical brass tube. The telescope is made to follow a star by a convenient application of clock-work motion, modified slightly from Fraunhofer's plan. The hour-circle is 2 ft., and the declination circle 18 in. in diameter. It is fitted up with a wire position micrometer, with the usual furniture of eye-pieces. For observations into which time enters, direct use is made of the transit-clock.

The rotative roof of the dome is neatly ribbed within by a frame-work of carpentry, and has three convenient openings extending together rather more than from horizon to horizon. It is 10 ft. in diameter, and traverses on three turned balls of lignum-vitæ. Though of sufficient weight to enable it to resist the heaviest gales, it is turned easily by hand. Without, the roof is of the semiconical pigeon-house shape frequently adopted in such buildings, and is covered with copper.

Other instruments connected with the observatory are—

A 20-in. portable transit-instrument by Troughton;

A 45-in. achromatic telescope by Dollond, with wire position micrometer and other equipments;

A comet seeker by Simms, on an equatorial stand;

An eight-day chronometer, by Molyneux;

A Daniell's hygrometer; two mountain barometers; some thermometers and a pair of small globes.

Mr. Snow has made good use of the means at his disposal, and many valuable contributions made by him to astronomy will be found in the Memoirs and the Monthly Notices of the Royal Astronomical Society.

THE OBSERVATORY OF CHARLES MAY, ESQ., F.R.A.S.

Mr. May, of the firm of Messrs. Ransomes and May, engineers of Ipswich, who have so ably carried out Mr. Airy's plans in the erection of the altitude and azimuth instrument and the large transit circle at Greenwich, has favoured us with the following account of an observatory constructed by himself at his private residence, and which he intends to furnish with good instruments.

Its dimensions and general plan resemble the Bedford Observatory described by Captain Smyth in his *Cycle.* The transit room is 17 ft. long, 12 ft. wide, and 9 ft. high. Two very substantial stone piers are provided for an instrument which may be of 6 or 7 ft. focal length if required.

The equatorial room is 16 ft. in diameter, covered by a dome similar in construction to Dr. Lee's; the floor is 4 ft. higher than that of the transit room, surrounding objects rendering a little elevation desirable; this room is built with a very solid foundation for the instrument, the lower portion being brickwork in cement, the upper Portland stone; the north pier is about 8 ft. by 3 ft. at the floor line, diminishing upwards to about 6 ft. by 3 ft. at a height of 6 ft. from the floor. Upon the brickwork at this height is a Portland stone 6 ft. by 3 ft., and 10 in. in thickness, forming the support of two other blocks of the same kind of stone, which have a clear aperture of 15 in. between them, similar to the two piers for a transit instrument. The object proposed by this form is to support the upper end of the polar axis in such a manner as to allow of the lower transits of the circumpolar stars being seen by the equatorially-mounted telescope. The shutter of the dome is in one piece, turning on the apex of the dome as a centre, and resting upon rollers at the base, and is moved by a rack and pinion. The full opening at the equator is about one hour of time.

So far as regards instruments, this observatory is not completed; a 20-in. transit, by Cary, is mounted on an iron casting cemented across the tops of the transit piers, and there is an indifferent clock with dead-beat escapement and wooden pendulum.

For the equatorial room a telescope, with a very fine object-glass of 6·34 in. clear aperture by Merz, of Munich, is mounted upon a cast-iron stand with polar axis and arcs divided so as readily to find an object; this stand is intended to be superseded by a polar axis upon the same general principle as that in the Corporation Observatory at Liverpool.

THE OBSERVATORY OF THE REV. JOHN SLATTER, F.R.A.S.

This observatory, recently erected by Mr. Slatter, was completed in the spring of the year 1850. It consists of one room whose size is 18 ft. 6 in. by 10 ft. 6 in. inside measure, 10 ft. 6 in. square being appropriated to the equatorial, the rest to the transit-room, of which, however, a portion has been cut off to form a porch. The roof of the equatorial room, which is of course revolving, is octagonal; the walls are of 9 in. brick, on which were laid octagonal frames of oak, which serve as the bed for the balls which support the roof to run upon. These are kept to their places by a circular oak curb made of eight pieces, the joints of which are made to quarter with those of the frame-work below; the base of the roof above the balls is the exact counterpart of this. The whole of this frame-work is put together with common bed-screws and tightened by tonguing. The roof is of deal rafters, and is in shape a sort of truncated pyramid, all the rafters from the angles beneath meeting at the angle of a square above of which each side is 2 ft.; this makes a zenith door, which is opened from below by a string acting on a bent lever, and the opening thus made is prolonged down the side, which is closed by one sloping door overlapping the aperture. The balls are four, of lignum-vitæ 4½ in. diameter, and the roof is moved by a cord and hook which fits in staples set at intervals; the end passing round an upright roller, and being then brought over a large pulley 1 ft. in diameter. The motion is so easy that an observer with the pressure of one hand can move it without rising from his seat, but even this is rarely necessary as the opening admits of following a star for at least an hour in most positions of the aperture. The angle of the octagon that falls on the division of the two rooms rests on a square brick pillar diagonally placed, behind which is the clock, so that the clock can be equally well seen from either room; this, which is found a most convenient arrangement, was suggested by Mr. Johnson.

The instruments are both by Simms. The meridian instrument is an 18 in. transit-circle, which is placed on a stone table; and, with *lead* plates between the iron frame and the stone, it keeps its adjustments with great accuracy. The telescope attached to the circle has a focal length of 28 in. with an aperture of somewhat more than 2 in. The circle is read by micrometers to 1″.

The equatorial has a focal length of 7 ft. 4 in., and a clear aperture of 4·9 in. It bears a power of 236 commonly, and with this will separate the components of any double star, which exceed 1″ in distance; up to this point its performance is satisfactory, such stars, *e.g.* as π Aquilæ, being beautifully separated. It shewed the ring of Saturn within a few hours of its disappearance. The declination-circle and hour-circle attached to it are of 18 in. and 15 in. in diameter respectively, and can be read to 5″ and 1s. respectively. Both the instruments were made by Simms. The clock is an old one by Fayrer.

The longitude of the observatory is 0h. 4m. 56·5s. west, and the latitude 51° 43′ 50″ north, which agrees closely with the position given in the Ordnance maps.

THE OBSERVATORY OF THE REV. W. R. DAWES, F.R.A.S., AT WATERINGBURY, NEAR MAIDSTONE.

We have had occasion already to make mention of Mr. Dawes in connexion with Mr. Bishop's observatory, of which he had the direction for a considerable period. Previously to this Mr. Dawes had established an observatory at his residence at Ormskirk, in Lancashire, where, for a period of several years, he confined himself chiefly to observations of double stars, the results of which are published in the fifth and eighth volumes of the *Memoirs of the Royal Astronomical Society.* It is but recently that Mr. Dawes has re-established his observatory at his present residence at Wateringbury, and our readers will remember, as an interesting fact connected with its re-establishment, the early announcement of the discovery, by himself and Mr. Lassell, of the third or interior ring of Saturn, contemporaneously with its discovery by Mr. Bond in America.

The observatory consists of a transit room and an equatorial room. In the transit room is a clock, and a 2-ft. transit circle having a 30-in. telescope with an aperture of 2¾ in. The circle is by Troughton and Simms : it is furnished with a rough reading-microscope, and four micrometer-microscopes, which are attached to a stout stone fork, forming part of the top of one of the piers; and they are so placed as to read off the divisions at the extremities of two diameters of the circle.

In the equatorial room is an achromatic refractor by Merz and Son, of Munich. The clear aperture of the object-glass is 6⅓ in., and its focal length 102½ in. English measure. It is mounted equatorially on Fraunhofer's plan, and is carried by clockwork. The hour-circle is 9½ in. in diameter, and is divided on silver to single minutes of time, which are subdivided by two opposite verniers to 4″. The declination circle is 12 in. in diameter, and is divided on silver to 10′, and its two opposite verniers read to 10″. The telescope is of great excellence : it shows the second satellite of Saturn (*Enceladus*) very plainly when near its greatest elongation, and separates stars of moderate brightness whose central distance does not exceed 0″·7.

The observatory and instruments, having been removed from Mr. Dawes' late residence at Camden Lodge, near Cranbrook, were erected at his present residence last October. Its geographical position is not yet accurately determined, but is approximately in north lat. 51° 15′ 12″, and east long. 1m. 39s.·8.

Mr. Dawes has procured some micrometrical measurements of Saturn's ring, which prove that the portion which he has observed lately and described in his paper to the Royal Astronomical Society, *formed no part of the ring* as it was seen and measured by Struve at Dorpat. This is very strange ; for, in addition to the splendid skies of Russia, the illuminating power of the Dorpat telescope was greater in the proportion of 92 to 40.

ORGANIZATION OF METEOROLOGICAL OBSERVATORIES UNDER THE SUPERINTENDENCE OF JAMES GLAISHER, ESQ., F.R.S., F.R.A.S.

We have hinted, in our accounts of the astronomical observatories, at an organization recently formed for making meteorological observations on a uniform plan and with well-tested instruments, and our work would be incomplete if a brief account were not given of the means by which this has been effected, especially as several of the observatories above-mentioned are furnished with meteorological instruments, and make regular observations. Of these, the observatories of Oxford, Rose Hill, Hartwell, Hartwell Rectory, Stone, Aylesbury, Cardington, and Southampton may be mentioned as taking part in the organization. In addition, there are upwards of thirty other stations in the British Isles at which observations are regularly made, included between 49½° and 56½° north lat., and between 1½° east and 6° west long.

This organization was planned by Mr. Glaisher in the year 1846, and by successive steps, under his active and talented management, it has arrived at its present form. At the present time there are observatories at almost every important station in England and Scotland, and a few in Wales and Ireland, which regularly transmit observations made under a uniform plan, with well-tested instruments, and reduced by means of tables (mostly the work of Mr. Glaisher) founded on the same elements.

To secure the ready and useful application of the observations thus made, a copy of them is sent monthly from each station to Mr. Glaisher (from Durham an account is sent weekly), and the quarterly results are also forwarded for his inspection before they are printed. The various elements relating to the pressure, density, temperature, and hygrometrical state of the air, and the usual weather results, are then forwarded to the Registrar General, and published in the *Quarterly Report of Births, Deaths, and Marriages.* They are also published in the *Philosophical Magazine,* and latterly in the *Civil Engineer and Architect's Journal.* In the arrangement of the observations, all abnormal phenomena receive particular attention, in the hope of deriving from them important conclusions respecting the theory of the weather.

From the extent of this meteorological combination, from the personal care used in selecting and testing the instruments, and from the rigorous scrutiny to which the observations are subjected, there cannot be a doubt that a very successful step has been made towards the obtaining of a better knowledge of the peculiarities of our climate, and the results now collected will be of incalculable service both in the every-day affairs of life and in the furtherance of the service of medical statistics.

We must not omit the mention of another organization in connexion with the different railroads in the British Islands, and under sanction of their directors. This has for its object, not only the determination of the direction and force of the wind, and the state of the sky in various parts of the country, but the immediate publication of the observations in a London journal, for the benefit of agriculture and other subjects for which a knowledge of the state of the weather over large tracts of country is desirable. The merit of this scheme, which has been most successfully carried out, is due to the spirited proprietors of the *Daily News,* who, in 1848, endeavoured, under great difficulties, to supply their readers with daily accounts of the simultaneous state of the weather throughout the country. The difficulties of obtaining the necessary intelligence were so great that in the autumn of 1848 the scheme was abandoned. The Astronomer Royal's attention having, however, been turned to the subject, which he considered of importance, the proprietors were induced, through his representations, to renew their efforts, and communications were opened with the directors of the leading railway companies; they were promptly responded to by the directors of the North Western, Great Western, South Eastern, South Coast, the Lancaster and Carlisle, and the York, Newcastle, and Berwick lines, and ultimately by very nearly all the principal lines.

The stations were, for the most part, selected by the Astronomer Royal, the principle of selection being that they should be more frequent in the hilly country, and especially on opposite sides of a chain of hills, and at different elevations. In the summer of 1849, all the stations were visited by Mr. Glaisher, who fixed at each a compass-card, determined the correctness of every wind vane near it, and remained till he was satisfied that the observations would be correctly made and regularly transmitted. In the autumn of 1850 several stations were revisited, and the system was partially extended to Ireland.

The plan of working is as follows:—At 9 A.M. on every day excepting Sundays, the required elements are noted by the station-master, and entered into a form provided for the purpose by the proprietors of the *Daily News.* This is forwarded to London by the first train, and the accounts from the different railways are collected after midnight by a messenger from the office of the *Daily News,* and immediately printed and published.

In addition to these observations, monthly reports of simultaneous observations taken at Brussels, and several other towns in Belgium, are forwarded to the Astronomer Royal, and passed to Mr. Glaisher; and similar reports are furnished from several towns in Ireland.

All the observations thus collected are represented graphically on maps previously prepared by Mr. Glaisher, the direction of the wind being denoted by an arrow; and many results, which seemed contradictory when unconnected, become reconciled when seen in connexion with the configuration of the intervening country, and many valuable hints are derived.

We may, in conclusion, mention that in connexion with, or rather growing out of, the above Meteorological Association, a Meteorological Society has been recently formed for facilitating the reduction and discussion of results, of which Mr. Whitbread is first president, and Mr. Glaisher the secretary.

We have now completed our survey of the observatories, public and private, that are either in London or its neighbourhood, or which are situated within the limits of an easy railway journey of it, and in concluding, we beg most heartily to offer our best thanks to the directors and proprietors of the several observatories, without whose hearty co-operation this work could not have been effected.

The published works which have been made use of in the compilation of the history and account of the Royal Observatory of Greenwich, are chiefly, *Baily's Life of Flamsteed; Rigaud's Life and Miscellaneous Works of Bradley; Delambre's Eloge of Maskelyne,* in the volume of the *Memoirs of the Institute for* 1841; the *Monthly Notices of the Royal Astronomical Society of London;* and the *Introductions to the Volumes of the Greenwich Observations.*

For the Observatory of Cambridge, the account has been compiled chiefly from the *Introductions to the Observations,* and from Mr. Airy's *Description of the Northumberland Equatorial.*

For the Observatory of Oxford, *Le Keux's Memorials of Oxford* have been consulted, as well as the *Introductions to the Observations,* though, for the description of the heliometer lately added to that establishment, we are indebted solely to the kindness of Mr. Johnson, the director.

We hope that the accounts thus collected with considerable pains will have more than a transitory interest. In the description of Greenwich, it has been our object, as far as was consistent with the necessary brevity, to give not only an authentic and accurate description of the building and the instruments, but also an intelligible idea of the leading processes pursued in that famed establishment. It is hoped that the visitor skilled in the use of instruments will find the brief account an assistance and a guide, while the unlearned visitor may learn enough from it by previous study, to render his walk round the observatory more interesting and instructive. In the descriptions of the other observatories, now for the first time published, the various methods which are explained, both of the construction and the use of instruments, may suggest many valuable ideas to the amateur astronomer, while it will also suggest the expediency, if not the necessity, of some attempt at an organization of labour for rendering this very large amount of observing materials conducive to the advancement of the science of astronomy.

PANORAMAS AND ELEGANT PLACES OF AMUSEMENT.

Colosseum, in the Regent's Park, called also the Cyclorama, a large circular edifice, with a massive portico in the Doric style of architecture, is a public exhibition, and contains a view of London upon a large scale, as it would appear from an elevated position, such as from St. Paul's. In addition there are conservatories of the choicest plants and flowers; fountains, with every fashionable amusement and recreation, natural and artificial, together with a saloon, containing works of the Fine Arts, &c., and a splendid concert room, the entrance to which is in Albany Street. The prices of admission vary. (See also pp. 719 and 720.)

Diorama, Regent's Park, situated in a row of fashionable houses turning out of the New Road, on the right, a few doors in the park, is an exhibition of architectural and landscape objects, generally well painted, consisting of a rotunda 40 ft. in diameter, so arranged and illuminated as to display by the best effects the changes of light and shade with the greatest accuracy in developing nature and art. The accommodation consists of boxes and saloon, the floor of which turns on a pivot, for the purpose of bringing the spectator to either subject, like the proscenium of a theatre, behind which are the pictures for exhibition. (See also p. 721.)

Panorama, Leicester Square, is an exhibition of ancient reputation. Paintings of the best description of scenic art are to be seen in this building, by the payment of 1*s*. each being made to either the upper or lower circle. Separate views of objects in each.

Cosmorama (Exhibition) in Regent Street, displaying views of several objects worthy of the scientific and curious. There are two galleries, in which there are convex lenses for viewing the several objects.

Gallery of Illustration, 14, Regent Street, Waterloo Place, Pall Mall.—The proprietors have a beautiful new Diorama of our Native Land, illustrative of England and its Seasons, in which they have endeavoured to depict the amusements and employments of a country life during the several varieties of Spring, Summer, Autumn, and Winter. The husbandman will be found pursuing his useful toil from seed time to harvest; his occupation in the field from the earliest budding spring to the gathering of the ripe golden crops; his more serious duties, his church and his God, form prominent features in the illustration; the sports of the field, pertaining to the higher classes, as followed by them in the beginning of the eighteenth century; the peasant's pastime, his may-pole and rustic dance, enjoyed after the labour of the day, are not omitted. This diorama, totally independent of the Overland Route to India, is exhibited in the lower gallery, accompanied with selections of nature, that so abound in the British poets, and have continued down from "The Flower and the Leaf" of Chaucer to modern times.

The grand moving diorama of the Overland Route to India still continues to be exhibited daily at 12, 3, and 8 o'clock.

Tourists' Gallery, Her Majesty's Concert Room, Haymarket.—Mr. Charles Marshall's great moving Diorama has been many months in preparation, and has engaged the pencils of numerous eminent artists, English and foreign, from the most recent sketches, and illustrates the grand routes of a Tour through Europe, commencing with the departure of the "John Bull" steamer from the Tower of London for Hamburgh.—Route through Germany, Prussia, Austria, Bavaria, and down the Danube to Constantinople.—Route through Italy.—Passes of the Alps, through Switzerland to Geneva.—Route down the Rhine to Cologne, and home.—The white cliffs of Britain.

The diorama is accompanied by a descriptive lecture, including historical and statistical detail, with appropriate music, which has been selected from the works of the first composers, and expressly arranged for the subject.

Admission, 1*s*.; reserved seats, 2*s*. 6*d*.; stalls, 3*s*.; private boxes for parties and families, 10*s*. 6*d*., 15*s*., and 1*l*. 1*s*.

Diorama of the Ganges, a very beautiful and much admired lounge, called the Portland Gallery, situated No. 316, Regent Street (Langham Place), opposite the Polytechnic Institution. Pianist, Herr Adolph; Lecturer, Mr. S. Walsh; machinery by Mr. Cooper; figures and animals painted by Mr. Buss; the diorama exquisitely painted by Mr. T. C. Dibdin, from the admirable sketches by James Fergusson, Esq., made during a long residence in India. Doors open at half-past 2 and half-past 7 p.m. Admission, 1*s*.; reserved seats, 2*s*. 6*d*.

Cummings' South African Exhibition, Chinese Gallery, Hyde Park Corner. Admission, 1*s*.

In the Egyptian Hall, Piccadilly, the Valley of the Nile to Nubia, a fine painting; and in the same building also a fine painting of the route to California.

Mr. Allom exhibits, in Regent Street, his remarkably fine painting, a panoramic view of Constantinople, painted and coloured in his usually vivid and accurate style.

The Bushman Ranger is an exhibition, or painting, depicting scenery of the country, and the extraordinary predatory life of the unfortunate cast-off members of society in the colonies.

Catlin's Exhibition, in Regent Street, of the portraits and warlike weapons and costumes of the backwoodsman and the North American savage.

Grand Exhibition of Art, Adelaide Gallery. Admission, 1*s*.

Madame Tussaud's Exhibition, Baker Street, Portman Square, is renowned for the numerous groups of characters, great as exemplars for the world's guidance—great as political leaders and adventurers—great as soldiers and sailors, on whom the world will look with admiration—great as villains, at whom the world shudders.

In Linwood's Gallery, Leicester Square, Mr. Brees exhibits the views of New Zealand, and delivers an explanatory lecture on the nature of the inhabitants and their country, with some account of the English settlers, their prospects, &c. Admittance, 1*s*. Also Cambon's grand moving Panorama of Paris, St. Cloud, and Versailles. Admission, 1*s*.

There are panoramas, dioramas, and other similar beautiful objects and exhibitions of several kinds, in Pall Mall and No. 5, Pall Mall East. The British Gallery, or Shakspeare Gallery, is one of great annual interest, containing the choicest subjects of the English school; this gallery is nearly opposite Marlborough House. Other collections are freely described elsewhere. There is also, in Pall Mall East, and Suffolk Street, adjacent, the Gallery of Water-Colour Drawings and the productions of British artists, or of those domiciled with us. There is what is called the "greatest wonder of the age," Cantelo's chickens always hatching, in No. 4, Leicester Square. Admission, 1*s*. There are, however, so many admirable displays of talent constantly springing up, that the newspapers of the day will best enlighten us in such matters: the first columns of the front page of the *Times* and other journals are diffuse in these particular advertisements for the information of strangers, and are the readiest sources for the visitor to consult.

PATENTS FOR INVENTIONS IN ENGLAND

Are grants to the inventors of new and useful machinery and processes in the arts, and by which certain privileges are secured to them for fourteen years, for the exclusive use and exercise of their inventions; after which term they belong to the community. Patents are therefore monopolies of a definite character; designed as a security to reward those whose ingenious faculties and practical skill have produced improvements of general utility and value. Patents for inventions may therefore be considered as bargains between the inventor on the one hand, and the public on the other; and the abuses to which these bargains are liable sometimes originate in their want of novelty, and not unfrequently from the invasion of the inventor's rights by public jealousy.

The laws under which patents are granted vary in their form in the several European and American States, and are all, in some degree, imperfect, and ineffective of their proper object.

In Great Britain and Ireland, *Letters Patent* (founded on statutes from the 18th of Henry VI., but mainly on the 21st of James 1. c. 3) are granted by the crown, on behalf of the public, to the inventor of any new machine, manufacture, or chemical process, for the sole privilege to make, use, exercise, and vend his said invention, during the term of fourteen years; and an inventor, as thus privileged, may be the first *inventor* absolutely, the first *publisher* if others have also made the same invention, or the first *importer* from abroad, into these realms, of an invention not previously herein used and exercised. British patents are granted as matters of course, provided certain legal forms are complied with, and the official fees duly paid.

The several processes in soliciting a British patent are as follow:—The inventor has to petition the crown to grant letters patent for his invention, of which, at this stage, he states the title, and lodges with the attorney or solicitor-general a brief outline of the process, or improved machine or apparatus he wishes to patent; and he accompanies his petition with a declaration of the grounds of his request, and the portions of the United Kingdom in which he wishes to secure his patent right. These documents are lodged at the office of the Secretary of State for the Home Department, whence they are referred to the Attorney or Solicitor-General; the selection of either of these officers being with the inventor. If no opposition occur there from *caveats*, which last for a twelvemonth, (these are formal notices generally entered by rival or inquiring inventors to gain information of applications for similar patents,) one of those officers makes a report on the petition, and recommends that letters patent be granted. This report is taken to the Secretary of State's Office, for the royal warrant, directing the bill to be prepared for the royal signature. The warrant is committed to the Attorney-General, and if not opposed, he prepares the bill, which is signed at the Secretary of State's Office. Under royal warrant, sealed with the royal signet, the bill receives the privy seal, and is then directed to the Lord Chancellor for letters patent to be made out and sealed with the great seal. From this practice, that of soliciting patents for Scotland and Ireland differs only in minor details, the common feature of the arrangement being that of different forms and fees.

Having obtained the great seal, the patentee, to complete his patent, has fully to disclose the nature of his invention, by drawings, if necessary, accompanied by a specification, which will enable a competent workman to carry out the invention; this instrument has to be enrolled in Chancery, in compliance with a proviso contained in the letters patent, within the time therein named. In the preparation of this instrument great care and judgment are needed, based on a knowledge of former patents, to frame the specification so that it shall explain with sufficient clearness the nature of the improvements, and have that value as property, which a good specification of a patent always has.

By a recent statute (5 and 6 William IV. c. 83), a patentee is enabled, under the authority of the Attorney or Solicitor-General, to amend his title and specification, if necessary, and to disclaim such part or parts of his invention which he may have since found to be old and untenable. This disclaimer must be made and enrolled previous to any legal proceedings being taken for infringement. Under the same statute, also, the inventor may petition for a prolongation of his term of fourteen years; which petition is referred to the Judicial Committee of the Privy Council, who grant the same, if the petitioner makes out a case, satisfactory to them, of extraordinary losses, or delays in being able to bring his invention into general utility, or other special reasons for the prolongation.

The *property* in a patent can be defended from infringement by a bill in equity, or action at law. It may be assigned, in whole or part, by the patentee, to any number not exceeding twelve persons. It may be mortgaged to any number of persons; and a patentee can also grant licences for the use of his patent, in a variety of modes, to an unlimited number of persons.

The *cost* of obtaining a patent, including fees for agency, if unopposed, is for England, £110; for Scotland, £80; and for Ireland, £135. If the patent be granted to two or more persons jointly, which it may be, extra fees are charged for the additional names; and if the Channel Islands of Guernsey, Jersey, Alderney, Sark, and Man, and the British Colonies and Plantations abroad, are included, a further expense of about seven guineas is incurred. To these items should be also added the cost of preparing and copying specification and drawings, the charges for which are of course very variable, according to length, intricacy, &c.

The expenses and regulations under which the foreign patents are granted vary considerably. The following brief epitome must suffice in this place.

In the United States of America, patents are granted only to the absolute inventor, always for fourteen years, and are granted or withheld at the option of the Government Commissioners of Patents. The amount of official fees payable *depends upon the country of which the applicant is a native.* Thus, a citizen of the United States, or a foreigner who has resided in the States one year next preceding the application, and has made oath of his intention to become a citizen, pays a fee of 30 dollars; *a subject of the Sovereign of Great Britain,* 500 *dollars; and any other foreigner,* 300 *dollars.* If the application for a patent be rejected by the Commissioner, two-thirds of the fees paid are returnable.

In France, patents for inventions are granted alike to natives and foreigners, and the duration of the privilege may be fixed by the patentee at five, ten, or fifteen years, the amount of tax being proportional to the term, namely, 500 francs for five years; 1000 francs for ten years; and 1500 francs for fifteen years; payable by annual instalments of 100 francs. The patentee thus enjoys the power of relinquishing his invention, if found unprofitable, at any time during the intended term, by ceasing to pay the annual instalment of fees.

In Belgium, patents are granted for five or ten years: imported inventions are patentable, and the whole of the Government tax, which is not heavy, may remain unpaid until the expiration of two years from the grant.

In Holland, patents are granted for five, ten, or fifteen years, and may be had for foreign as well as native inventions. The fees for a patent for five years, are 150 guilders, or £12 10*s.*; and for terms of ten or fifteen years, they vary from 300 to 750 guilders, or from £25 to £62 10*s.*

In Prussia, Russia, &c., the Governments exercise a discretionary power in granting or refusing patents, and the laws are of a stringent and arbitrary character.

In Austria, patents are granted for terms from five to fifteen years; the taxes must be paid when the application is made, and the invention put in practice within one year from the date of the grant.

The German and Italian States have patent laws peculiar to themselves, but generally similar to those already described.

The principal patent agents are Messrs. Carpmael, Old Square, Lincoln's Inn; Mr. Charles Cowper, Southampton Buildings; Messrs. Newton, Chancery Lane; Mr. Robertson, Mechanics' Magazine Office, Fleet Street; Mr. William Laxton, Fludyer Street, Westminster.

PUBLIC AND PRIVATE BUILDINGS.

Admiralty, in Whitehall, formerly Wallingford House, a red brick structure, of the time of William III. The present front elevation was built in the time of George I., by Thomas Ripley, the architect of Houghton Hall, Norfolk. It is in the interior a convenient and capacious building. The exterior is not what would now be called in good taste. It recedes from the street; a stone screen in the front was built subsequently by Robert Adams, with some emblematical appropriate ornaments. In this edifice the whole of the naval affairs are managed, excepting the accounts; and these, with the offices of the Surveyor, Accountant-General, Store-Keeper-General, Comptroller of the Victualling and Transport Service, Inspector-General of Hospitals and Fleets, and the Naval Architecture and Engineering, &c., are in their several departments conducted at the Admiralty Office, Somerset House. In the Admiralty, Whitehall, the First Lord and the Lords Commissioners sit and hold levees of naval officers, and transact the great affairs of the administration of the navy. The correspondence emanates also from this, the principal office. In this edifice, there is a residence for the First Lord. The other lords, according to recent regulation, have not as previously, any residence. The semaphore, or telegraph, which was formerly at the top of the building, no longer exists. The electric wire, in communication with the several ports, are within the Admiralty. The Court of Admiralty, as it is so called, to decide legal questions, is held in Doctor's Commons, near St. Paul's.

Harbour Department.

Bethune, Capt., C.R.D.B., R.N., C.B.	*Members of Department.*
Vetch, Capt. J., R.E., F.R.S.	
Washington, Capt. J., R.N., F.R.S. .	*Inspector of Harbours.*
Braine, R. P.	*Clerks.*
Eveniss, G. H.	
Shillinglaw, J. J.	
Lowrie, W.	*Draughtsman.*

The duties confided to this important branch of the Admiralty, are —to watch over the interests of the public in the tidal rivers and navigable waters of the United Kingdom of Great Britain and Ireland, in order to prevent any injury to the same by embankments, railway interferences, bridges and other structures; and to examine and report to the Board of Admiralty on all applications for the erection of such works.

The power, interest, and jurisdiction of the crown, extend, in right of the crown, over all the seas and shores surrounding the kingdom, and over the soil in all rivers which have the flux and reflux of the sea, up to high-water-mark of ordinary spring tides; but the Lord High Admiral, or Lords Commissioners for executing that office, possess, by prescription recognised by statute, the *conservancy* of these harbours, tidal rivers, and navigable waters; and it was to carry out these duties, as well as others which devolve on their Lordships, from the working of the 11 and 12 Vic. c. 129 (*Preliminary Enquiries Act*), that this department was formed.

The Archives of the Department contain a vast quantity of Documents, and Records, Maps, Charts, and Plans connected with the Harbours of the Kingdom.* These are the result of the desire on the part of the Board of Admiralty, to have an accurate Report of the present condition of each Harbour, good Charts of its Waters, accounts of its Tides, of its Approaches, and of its Commerce; of the Dues, and other sources of Income raised; of the expense of Maintenance, and of the Works in progress or in contemplation; Abstracts of the Acts and Charters by which it is governed, and the constitution of the governing body, and any other statistical or interesting information which might regard it; so that should their Lordships have occasion to trace back the history of any harbour, and of the changes which may have taken place in it from time to time, whether from physical or other causes, they have the materials for so doing always at hand.

Apsley House, the town residence of Field-Marshal the Duke of Wellington, is the last or westernmost on the north side of Piccadilly. It is named after Baron Apsley, better known as Lord Chancellor Bathurst, who commenced it in 1784. It passed to its present illustrious owner in 1820, and in 1828, the original exterior of red brick was covered with the present casing of Bath stone, designed by Mr. B. Wyatt. The iron blinds to protect the windows were erected in consequence of the riots attendant on the obstruction of the Reform Bill. This mansion contains some fine pictures. (*See* "Galleries.")

Archways, ornamental. 1. The earliest and most original in design is that built by Inigo Jones as a water entrance to York House Gardens, and still standing a little east of Hungerford Bridge. It is comparable with the finest inventions of this kind by the Italian masters. 2. The next in point of time is Wren's Temple Bar, one of the first of his designs, and certainly far from possessing anything remarkable or even graceful. Structures purely ornamental gave no scope for the peculiar bent of his genius, and exposed only his failings. 3. The archways giving access to Somerset House quadrangle, at its north-east and north-west corners, are among the happiest morsels ever designed by Sir William Chambers. Their merit will appear more striking by a comparison with the next, viz.,

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* See also Sir John Rennie's admirable work on Harbours, now publishing in monthly parts.

4. The triple entrance into Hyde Park, from Hyde Park Corner, which has the same disadvantage of thinness (forming mere arches in a wall, rather than arch*ways*) but with this difference, that in Chambers' gates the thickness is felt to be sufficient, but here (owing to the more representative treatment) ridiculously insufficient; the unreal character of the whole being greatly increased by the mimic colonnades. 5. The arch opposite to these, leading into the Green Park, was erected after a design of Decimus Burton, in 1828, and intended to receive, as a finish, a statue in a quadriga, looking towards the front of the arch, as in the representations on antique medals. This, placed on the centre of the attic, would at once have afforded a motive for that feature (now apparently meaningless), and have gracefully pyramidized the whole structure, which the present substitute (an equestrian statue of the Duke of Wellington) does only in a very imperfect and lopsided manner. Without entering into its sculptural merits, it must be allowed that, viewed architecturally alone, it is far from well placed, being at once too large to produce the required pyramidal finish, and too small to occupy the pedestal originally provided, without the addition of a second, which renders the former motiveless, and stamps the whole with that character of patchiness which seems inseparable from works begun with one intention and finished with another, if we may draw any conclusion from the experience of English architecture for the last two centuries, during which this proceeding seems to have been general. This peculiarity of our country and times is indeed nowhere more strongly displayed than at this Hyde Park Corner, which, as the only ornamental entrance to the capital, would, in most other countries, have been attempted to be treated *as a whole*, and (whether grandly or meanly, richly or plainly) at least with some union or symmetry between the entrances of the two parks; while we have not even been able to finish each of these gates as a whole in itself. The Corinthian order used to decorate this arch is from that splendid fragment in the Roman forum commonly assigned to the temple of Jupiter Stator, and (though its rare degree of richness and delicacy is sadly ill suited to stand under the plain and solid mass of a mere pedestal to a colossus) yet it is remarkable as the closest copy we have of that famous exemplar, repeating faithfully all the enrichments that its diminished scale would permit. The stone, however, being very perishable, they are rapidly disappearing. The only legitimate use for the attic over such an order would have been to protect statues or receive sculptures on its own faces (as in the Roman originals of this kind of structure), and then no other finish would have been necessary. The greatest peculiarity (and at the same time greatest fault) of this archway is the sham entablature continued across the widest intercolumn, and which it is to be hoped may one day be removed back to the body of the building, as the coupled columns will still obviate the solecism of a distinct bit of

entablature over each. Even if the bending of the architrave did not betray its unreality, it forms with the columns an opening ungracefully wide for its height, besides suggesting the question, if so wide an interval can be trabeated, what is the motive for arching a narrower one? *

Ashburnham House, *Piccadilly.* The residence of the Russian Ambassador, No. 30, Dover Street, Piccadilly.

Ashburnham House, *Westminster.*—A mansion erected by Inigo Jones, for the Ashburnham family, but now a prebendal house, situated south of Westminster Abbey cloisters. In 1731, when occupied by Dr. Bentley, and containing the Cottonian MSS., the greater part, with 114 of those precious volumes, was destroyed by fire, the Doctor having however, on the first alarm, saved the Alexandrian MS. Only the staircase and two rooms (a drawing-room and what was intended for a state bed-room) now remain of Jones's design.

Ashburton House, *No.* 82, *Piccadilly* (also called Bath House, after one which formerly occupied the same site), was erected by Alexander Baring, Lord Ashburton, and adorned with a rich collection of pictures. (*See* Galleries, Private.)

Banqueting House, *Whitehall* (now Chapel Royal). This apartment having been described (*see* "Architecture Third Period," page 177), we need only here add that it replaced the banqueting house of the Tudor Palace, that room being burnt down 12th January, 1619, and the present commenced in the following June, and finished within three years, at a cost of 14,940*l.*, exclusive of 713*l.* for constructing a pier in the Isle of Portland for embarking the stone. The pay of the master mason was 4*s.* 10*d.* the day, the workmen from 12*d.* to 2*s.* 6*d.* The ceiling paintings, on canvas, were painted abroad, by Rubens, in 1635, for 3000*l.* There is a bronze bust of James I., by

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* Besides these, one archway of a very costly description, though little decorated (being entirely faced with Italian marble), was erected by George IV., before Buckingham Palace, but, on the enlargement of that building, was necessarily taken down, and is now erected on the site of Cumberland Gate. Its whole design is easily described in very few words, being merely the arch of Constantine, stripped of all its sculptures, with empty frames to show where the bas-reliefs were meant to be, with the attic reduced in height about two-thirds, and the places of the eight colossal statues supplied by scrolls like inverted brackets, to afford an excuse for the columns, by removing them from the condition of pillars supporting nothing, into the less *visibly* absurd category of buttresses to abut nothing. But it would be too much to expect realities in the details of that which, as a whole, must be, in every point of view, a sham. Even the original triumphal arches were, as regards *detail*, (like all the Roman works), merely representative or second-hand art, their merit consisting in adaptation, not invention; yet, *as a whole*, they were original and fitted to their double purpose, as a gate and as a monument. But our arches (like most third or fourth-hand counterfeits), serve no end; they are gates to lead through nothing, and monuments to commemorate nothing. The former solecism might indeed, in this case, be obviated by making the arch serve as an entrance through some enclosing wall, as that of Burlington House, or the Bank (were it not already dressed up in mimic features); and the latter by sculpturing some of the starved bare panels, and replacing the scrolls by statues, the only objects at once beautiful and important enough to justify such an apparatus for their support. Doubtless where sculpture is so scarce as with us, the placing it much above the eye is a pity (and such a motive may have led the Romans to choose so frequently for these monuments such situations as the foot of a bank or flight of steps), but if the sculpture have only the degree of finish fitted to its situation, no labour is wasted; and even if (as in the Parthenon) the most finished sculpture in the world were placed near the top of a building, though some would call it a pity, it would be less so than the senseless collocation of parts, or the erection of a sham.

Le Sueur, over the door. The precise spot where Charles was executed is uncertain, some saying he passed to the scaffold through a window, others through a hole broken in a wall. The building was first made a chapel by George I.

British Museum. (See "Learned Societies and Museums.")

Burlington House, *Piccadilly*, was erected about 1665, by Denham, the nominal Crown Purveyor (the real designer being Webb, the pupil of Inigo Jones), for Lord Burlington, father of the celebrated architect; but entirely remodelled by the latter about 1720. This mansion occupies altogether about 8 acres, which is more than any other London residence at present; though a portion of the original garden was taken to build the street, called Burlington Gardens, and another for the adjoining arcade, which alone is said to yield a rental of 4000*l.* The house, which stands centrally, between the garden and an enclosed front court, is of brick, and, though symmetrical, far from ornate or ornamental. Of another house planned by Lord Burlington (not now standing) Lord Chesterfield, for whom it was designed, said, "that to be sure he could not live in it, but intended to take the house over against it, to look at it." If this hint had been followed, perhaps men of taste and fortune would have conferred a double benefit on their neighbours by beautifying *both* sides of the street wherever they built; but the noble architect adopted unfortunately, like most of his contemporaries, a different mode of obtaining an architectural prospect, at no less expense to himself, yet with no advantage to his neighbours. The house is evidently built, not like Lord Chesterfield's, to look *at*, but to look *from;* yet the beautiful scene provided for the eyes of its inmates is not "over against it," but enclosed in its own fore-court, and jealously excluded from profane gaze, by a lofty wall, presenting externally the aspect of a convent, or rather a prison. Walpole says of the colonnaded scenery within, that "we have few samples of architecture more antique or imposing;" and Sir William Chambers, "few in this vast city suspect, I believe, that behind an old brick wall in Piccadilly there is one of the finest pieces of architecture in Europe." It is incontestably the *very* finest erected for the exclusive view of a single house. This extreme and perhaps unparalleled degree of æsthetic selfishness is peculiar to the London mansions of the last century; and, however painful may be the idea they impress of utter isolation and absence of sympathy between their builders and the *profanum vulgus* without, they are surely no less melancholy as indirect monuments and witnesses to the excessive degradation of taste in the latter. For, if the domestic building of the people had not fallen to such a degree of disgusting falsehood and consequent deformity, that men of refined or cosmopolite taste could not tolerate the sight, they would not (as many as could afford to do so) have immured themselves in an artificial scene, to shut out the odious view of their neighbours' works. In these oases of taste, a certain degree of truth lingered, till vulgarity had scaled the pyramid of society to its summit, and leavened the whole mass. Then English art ceased to be "so exclusive." No more Burlington and Chesterfield walls were built, because there was no longer any difference of principle between the art displayed without and within them.

It is sad to observe how many steps yet lower, general design has fallen since this. Really the meanest houses of the time of George I. and II., those same erections whose ugliness drove the noblemen of those times to create around themselves these costly screens, now strike the eye, wherever we meet with them, as a grateful relief, and by the force of contrast with their younger neighbours, seem actually beautiful. Their wooden modillion cornices produce some shadow; their window-frames some finish, a mitigation of the rudeness of square holes; their undisguised roofs some appearance of habitability; their even-tinted and accurately-wrought brickwork some evidence of neatness and respect to those without; and often (though not always) their straightness and truth of lines and angles, the result of an unflinching foundation, indicate a stability that is no small beauty, and cannot be counterfeited. In a word, though nothing in them be quite what it pretends to be, and though all their wood and brick represent the forms of stone, yet they are honesty and unpretence itself, compared with the odious tissue of deceits lifting its ghastly bankrupt meanness by their side. It is said "when things come to the worst they mend," and one is tempted to think, surely English building art must at length be come to the worst; yet so thought the last generation and many before it.

CHARTER HOUSE (or *Chartreuse*), formerly a monastery of Carthusians, founded by Sir Walter Manny, in 1371, on a cemetery, north of Smithfield, in which it is said 50,000 persons had been buried in the great pestilence of 1349–50. This convent being suppressed with the rest by Henry VIII., the ground and buildings passed through various hands, and, what is very singular, twice reverted to the crown by the execution of their owner for treason; viz., in 1553 on the execution of the Duke of Northumberland, and in 1572 on that of the Duke of Norfolk. The last owner was Thomas Sutton, who, having bought the site in 1611 for 13,000*l.*, founded the present triple institution, an hospital, chapel, and school, which Fuller calls a "masterpiece of Protestant English charity." It is governed by the Sovereign and fifteen of the chief officers of state, and has a master of the hospital and of the school, preacher, second master, forty boys, and eighty poor brethren. The latter wear black gowns, and are provided with lodging, fuel, provisions and pecuniary allowance. Among the masters have been Dr. Thomas Burnet, and among the scholars, Isaac Barrow, Sir W. Blackstone, Addison, Steele, Wesley, Lord Chief Justice Ellenborough, Bishop Thirlwall and Grote (historians of Greece), Lord Liverpool (the Premier), and Bishop

Monk. Of the buildings, no part can be referred to the original foundation of the monastery, though the gateway, the chief Tudor fragment, may possibly be of the 15th century. Part of the hall, and the great staircase and governor's room, are Elizabethan, and the latter contains tapestry. In the master's lodge are many good portraits.

CHELSEA COLLEGE, called by Laud "Controversy College," was founded by Dr. Matthew Sutcliffe, Dean of Exeter, and incorporated by James I., on May 8, 1610, "to this intent, that learned men might there have maintenance to aunswere all the adversaries of religion." Two of its fellows were to write the history of their times, and Camden and Hayward were appointed to this office. Only one wing of the intended building was ever erected. It became during the civil war a prison, and after the Restoration was given to the Royal Society; but, on determining to erect the present Military Hospital, the king bought back his gift, and its site forms part of that now covered by this vast establishment.

CATHEDRAL OF ST. PAUL.—This, like most of the English cathedrals, traces back its history to the earliest days of Christianity, and is intimately connected with the introduction thereof into this island, and many eventful changes that preceded its final establishment. Though there is great uncertainty about the history of all these venerable institutions before the arrival of Augustine, it is known from the testimony of Tertullian, that before the year 200, the new religion had penetrated all parts of Britain, even those corners inaccessible to the Roman arms, and London was then a trading post of some note *. It is certain at least, that in 314, immediately after the conversion of Constantine, *Restitutus*, Bishop of *London*, was one of three British prelates deputed by their brethren to attend the general Council of Arles; and at that of Ariminium, in 359, the Church of London was also represented.

The invasions of the Saxons seem to have extinguished the true religion in all the states they founded, and by the time of the completion of the heptarchy in 586, British civilization and Christianity were confined to the western watershed of the island. The churches were profaned to the worship of Woden and Thor, and this must have been the case in the capital of the East Saxons for above 70 years, when the Romish missionary, towards the end of the sixth century, established himself at Canterbury, and having converted Ethelbert, King of Kent (and at that time *Britwalda*, or arbiter of Britain) found everything favourable for extending his religion and his influence into the other states. *Mellitus*, under the title of Bishop of London, was sent to convert this city and *Sebert* its monarch, who, about 610 (for the exact date is involved in some difficulty) was baptized, and "immediately, to shew himself a Christian indeed," founded two churches, one in the "Thorny island," about two miles west of London (hence called *West-Minster*), and the other on the highest ground within the city walls, most probably the site of the desecrated British cathedral. Tradition says that the former edifice replaced a temple of Apollo, and the latter that of Diana. In laying the foundations of the present structure, Wren found what might have been remains of sacrifices, but he rejected the tradition because there were no fragments of columns or cornices. Yet it is not probable that the works of that dark age would retain any vestiges of Roman architecture, or even any finished masonry; most likely both the temples and the churches were chiefly or entirely of timber, like those of Scandinavia.

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* It is believed, on the concurrent testimony of Eusebius, Theodoret, and others, that soon after the year 60, Christianity was planted in this island either by St. Paul, or by his British disciples, Pudens and Claudia (2nd Epistle to Timothy, iv. 21, and Martial, Lib. iv., ep. 13, and Lib. xi. ep. 54), this Claudia being of the family of Caractacus. The British Triads also state that the father of Caractacus went to Rome as an hostage for his son, and others of his family, and after staying seven years, brought back the knowledge of Christianity. At this time, however, London (pillaged and burnt by Boadicea in 61) was but an unwalled village of less note than either Colchester or Verulam, neighbours that would now hardly be perceived if absorbed into its suburbs.

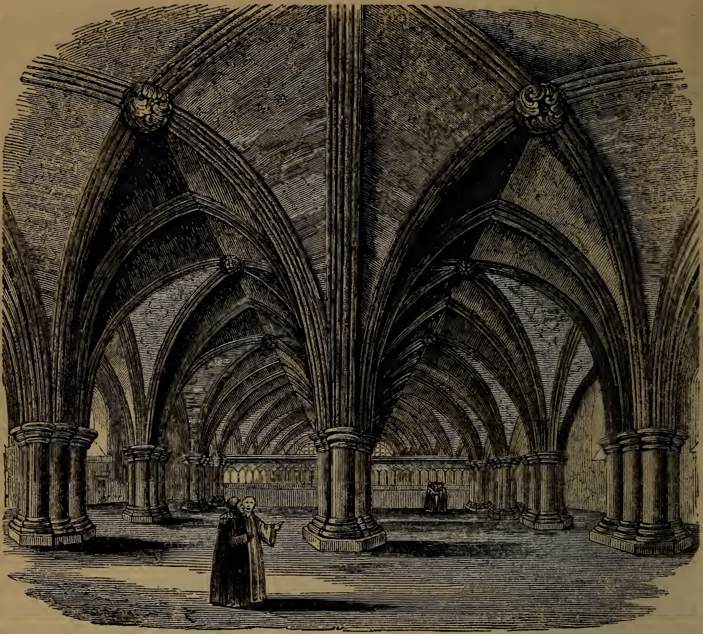
Monkish traditions attribute the first public recognition of Christianity to a south British prince, named Lucius, about the year 170, and place the first religious establishment on the site of the present cathedral of Winchester (which also, by a strange coincidence, contains our oldest architectural remains of any magnitude), but the authorities for this (though Bede is among them) are not generally credited.

On the death of Sebert, however, about 619, his sons apostatized, a persecution of the Christians ensued, Mellitus was banished into Kent, and the East Saxons relapsed into Paganism forty years. Meanwhile the efforts of Augustine and his successors to spread their religion over the remaining Saxon states were successful, but in the west and north they called forth vigorous and lengthened opposition from the ancient British churches, who would not submit to the innovations and foreign authority of Canterbury and Rome. In 624, Edwin, king of Northumbria, being then Britwalda, was converted by Paulinus, but this also was only temporary, for five years afterwards this prince was slain, his family and Paulinus escaped into Kent, and the Northumbrians were again immersed in Paganism till the accession of Oswald; who, embracing Christianity but protesting against the Papal authority, suppressed the see of York and erected that of Lindisfarne, under Aidan, an independent Scotch bishop. It was from this source that London became a third time Christianized by *Chad*, a Northumbrian missionary, who was the first of its present line of bishops. Not till 694, in a conference at London, were these ecclesiastical disputes finally settled, by the submission of the whole English church to the Kentish Primate.

In 961–2 the Cathedral was burnt and rebuilt or repaired, but it continued probably a building of small extent and importance till after the Norman invasion, when nearly all the churches in the country began to be rebuilt on an enlarged scale and with great splendour. Edward the Confessor had already replaced the little minster of Thorny island by one nearly or quite equal to the present in extent; and the growing importance of Westminster and London now beginning to attain that pre-eminence which their geographical position ensured, led to the commencement of the vast pile, usually called "*Old St. Paul's*," in 1083. The work was continued by successive bishops, till the steeple (of timber), rising to the unequalled height of 520 feet, was completed in 1222. But the wondrously rapid progress then made and being made, in every branch of architecture, must have rendered the Norman work of a previous century now antiquated and unsatisfactory to the age that could produce such works as those at Southwark, Salisbury, and the hundred other gems of the "Early English." Accordingly the history of almost every such edifice, during the 12th, 13th, and 14th centuries, presents a continual process of pulling down the oldest part, to rebuild it with the latest improvements; then to subject the next oldest portion to the same change; and so on, as long as architecture continued a living art. Accordingly the munificence of Henry III., at Westminster Abbey, excited the emulation of the Londoners, and in 1240 they completed a new choir, or a remodelling of the old one into the pointed style, with three light windows and tracery. The east end (which was extremely beautiful) must, to judge from the rude engravings of Hollar, have been remodelled at later periods; but the nave, as far as we can learn from the same views (which are not even exact enough to distinguish always between pointed arches and round ones), must have retained, except in the vaulting, its Norman character; and the tower its Early (or rather nascent) English, of the period of Richard I. or John.

Old St. Paul's was, in some respects, the most remarkable of Gothic churches, and carried out the English peculiarities of proportion to an exaggerated degree. Besides the extraordinary height of its lead-covered spire, the central vista was extended to the length of nearly 700 ft., exceeding that of any other church till the erection of the present St. Peter's, and internally longer even than that (excluding its porch). The transept was also longer than that of the present or any Gothic cathedral; but this extreme lengthiness was not accompanied (perhaps some would say, not counteracted in its effect) by any unusual spaciousness, such as the largest continental churches possessed, for the height of the vaulting was only 100 feet, or equal to that at Westminster. Indeed, if we can fancy the middle avenue of that Abbey extended to double its present length, and terminated by (instead of the apsis) an end similar to those of the transepts, we shall have a tolerable idea of the interior of Old St. Paul's. This vast pile seems to have had double aisles throughout,—a splendour of which England affords no other example; and, though patched in so many styles, its general form was remarkably simple, having square terminations, none of the low chapels so usual at the east end, and no minor transept, porch, or other excrescence. The great eastern rose window, above a row of tall lancet lights, must have been singularly beautiful.

Under the choir was an Early English crypt, used at the parish



CHURCH OF ST. FAITH.

church of St. Faith, and adjoining the west front (and corresponding in place to the "Jerusalem chamber" at Westminster), was the parish church of St. Gregory; so that, as Fuller said, "St. Paul's may be called the mother church indeed, having one babe in her body and another in her arms." South of the nave was an octagonal chapter-house, standing detached in the centre of the cloisters, which enclosed a small square, not larger than that at Westminster. These cloisters were decorated in the reign of Henry V., with a very celebrated Dance of Death, painted on wood, and representing "Death leading all Estates," from the pope to the child; with the speeches of Death and the answer of each estate, imitated from the German of Machabre, each speech being in eight lines, and headed thus, "Death speaketh to the Pope." "The Pope maketh aunswere." "Death speaketh to the Emperour." "The Emperour maketh aunswere," &c. The whole poem has been preserved by Dugdale.

Immediately after the Reformation, this temple was so desecrated as to become a thoroughfare not only for men carrying all sorts of wares and provisions, but also for beasts of burden. On the accession of Mary this was stopped; but, for about a century, "Paul's Walk" (*i.e.*, the middle aisle of the nave) continued not merely the fashionable lounge, but the news-room, exchange for merchants, and market for hiring servants. Thus Falstaff says of Bardolph, "I bought him in Paul's." The largest monument in the nave, that of John Beauchamp, falsely ascribed to the famous Humphrey Duke of Gloucester, gave his name to the "Walk," and "Dining with Duke Humphrey" means loitering near his tomb, in the hope of an invitation from some one of the throng of idlers.

In 1561, the famous timber spire was set on fire by lightning, and entirely consumed, with great part of the roofs; and from this time the building fell into a decaying condition, till the repairs commenced under James I., by Inigo Jones. The beautiful Corinthian portico (*see* Architects, Jones) was then added "as an ambulatory for such as usually walking in the body of the church, disturbed the solemn service in the choir." It was accordingly soon filled with the stalls of seamstresses, and other petty dealers. Besides the west front, all the Norman part of the exterior as far east as the transept, inclusive, was encased in rusticated masonry (like that of the present building) and Italianized as far as was practicable, but it does not appear that the Gothic choir was ever intended to undergo this transformation *.

On the Restoration these works were recommenced under the direction of Wren; but, for want of funds, nothing beyond planning had been effected when the great fire happened, four years after.

> "The daring flames peeped in, and saw from far
> The awful beauties of the sacred quire,
> But since it was profaned by civil war,
> Heaven thought it fit to have it purged by fire."

The present edifice (see pages 181 to 192), though occupying most of the site of the former, retains no portion, even of its foundations; not having even its axis parallel with that of the old cathedral. Its architecture having been described above, we shall here only notice the monuments, distinguishing by italics those which are most remarkable in themselves as works of art; the others being chiefly observable for the extrinsic interest derived from the great men they commemorate. We begin from the south door, proceeding westward.

1. General Gillespie, 1814, by Chantrey. 2. Sir Astley Cooper, 1841, by E. H. Baily, R.A. 3. Sir John Moore, 1809, by Bacon, Jun. 4. (under west window of transept) *Sir Ralph Abercrombie*, 1801, *by Westmacott*. 5. (against east side of great pier) Captain Burges, 1797, by Banks. 6. (south of same pier) Captain Sir Wm. Hoste, 1828, by Campbell. 7. (over the last) Captain Hardinge, 1808, by Manning. 8. (west of same pier) Dr. Babington, 1833, by Behnes. Major-Gen. Sir Isaac Brock, 1812, by Westmacott. 10. (in the angle turning to the nave) Sir William Jones, 1794, by Bacon. 11. (the only monument in the nave, under its middle south window) Bishop Middleton, 1822, by Louth. 12. (in the angle turning to the north transept) *Sir Joshua Reynolds*, 1792, *by Flaxman*. 13. Major-Gen. Houghton, 1811, by Chantrey. 14. (against the pier) Sir William Myers, 1811, by Kendrick. 15. Sir Pulteney Malcolm, 1838, by E. H. Baily, R.A. 16. (north of the same pier) Earl St. Vincent, 1823, by E. H. Baily, R.A. 17. (east of the same pier) Captain Westcott, 1798, by Banks. 18. (under west window of transept) Lord Rodney, 1792, by Rossi. 19. (under north window) Sir Thomas Picton, 1815, by Gahagan. 20. Generals Crawford and Mackinnon, 1812, by Bacon. 21. Sir Andrew Hay, 1814, by Hopper. 22. Generals Gore and Skerrett, 1814, by Chantrey. 23. Sir William Ponsonby, 1815, by E. H. Baily, R.A. 24. (under east window of transept) Captains Mosse and Riou, 1801, by Rossi. 25. Major-Gen. Bowes, 1812, by Chantrey. 26. General Le Marchant, 1812, by Smith. 27. (north side of pier) Admiral Lord Duncan, 1804, by Westmacott. 28. (west of same pier) Major-Gen. Dundas, 1794, by Bacon, Jun. 29. (above the

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* Our engraving (page 205), represents the tower and spire as James and Charles *intended* to have restored them. The spire never being rebuilt after 1561, and the portico not begun till 1633, of course they never existed together as here shown.

last) Generals Mackenzie and Langwerth, 1809, by Manning. 30. (at the angle turning to north aisle of choir) *Dr. Johnson*, 1784, *by Bacon*. 31. (against the pier, north of the ante-choir) *the Marquis of Cornwallis*, 1805, *by Rossi*. 32. (over the last) Captain Cooke, 1805, by Westmacott. 33. (against the opposite pier) *Lord Nelson*, 1805 *by Flaxman*. 34. (over the last) Captain Duff, 1805, by Bacon. 35. (in the south aisle of the choir) *Bishop Heber*, 1826, *by Chantrey*. 36. (at the angle turning into the south transept) *John Howard*, 1790, *by Bacon*. 37. Major-Gen. Ross, 1814, by Kendrick. 38. General Cadogan, 1813, by Chantrey. 39. (under the window) Earl Howe, 1799, by Flaxman. 40. (under south window) Lord Collingwood, 1810, by Westmacott. 41. (next the door) Generals Pakenham and Gibbs, 1815, by Westmacott. 42. (against south end of pier) Lord Heathfield, 1790, by Rossi. 43. (west of the same pier) Captain Faulkner, 1795, by Rossi. 44. (over the last) Captain Miller, 1797, by Flaxman.

The first monument erected was that of John Howard, and the second that of Dr. Johnson opposite. Both are very fine statues, and foreigners used to mistake them, not without reason, for St. Peter and St. Paul. To the simple dignity of the earlier monuments, succeeded the rage for flying Victories, Fames, and Neptunes, with strange infatuation called "*classic;*" (as if, in classic times, monuments were dressed up in the trappings of an obsolete or foreign mythology). To this, however, succeeded a rule more tyrannous; more utterly destructive of sculptural art, by reducing the chief part of its work to a mere handicraft; and yet, if possible, still more mistaken. Under the ridiculous notion that the classics represented their statues in the dresses worn at the time of their erection (an egregious error, for in the best periods, whether of ancient or of mediæval sculpture, it used no *dress* but only *drapery*), it has become a maxim that statues should perpetuate, as an essential part of their hero, the last fashions introduced by the contemporary tailors; an office that Sir Joshua Reynolds well observed might safely be left to the cheaper class of paintings or engravings, without prostituting the perennial marble to so base a purpose, or reducing a great art to a mechanical trade, for the sake of recording what, when it becomes interesting at all, can only serve to amuse an antiquary. We cannot but think that since the rise of printing, and especially of "*Magasins des Modes*," there is little danger of antiquaries, who are in earnest, losing sight of any one of the long series of these ingenious expedients for enabling the rich to change their marks faster than the poor can counterfeit them; and perhaps the oblivion of one step of this race would, after all, be no very serious loss to posterity, for if the things themselves be not worth preserving many months, it is difficult to see why their images should be so carefully perpetuated. If, however, their preservation be of such importance, surely this object might with advantage be separated from one so discordant as the commemoration of our worthies. The fashions of each year or lustrum might have a distinct monument specially devoted to them; or, if economy forbid this, they might at least be displayed on the pedestals or other accessories of the monuments, instead of being hung on the immortals' backs, where their only effect must be, as soon as the fashion has changed, to render their wearers ridiculous. Surely a better permanent coat-block might be found than the image of a hero. If the tailors have not scope enough in disguising the bodies of all living, death might at least emancipate from their sway. If Earth affords not room for the due display of their ingenuity, it need not therefore be thrust into Paradise. However the remonstrances of our great art philosopher, though anticipating the coming tide, were as powerless against it as Canute's voice. It is now an established rule that buttons and button-holes are not only parts of the man, but parts of the immortal; that when 6 feet of marble are said to be devoted to the memory of a worthy, it is meant that one foot is devoted to him and five to his tailor; and that in the former fragment the sculptor must contrive to express the highest aims of art, while all the rest is given to caricature; a task which, as Sir Joshua said, would baffle the skill of Phidias himself.

It is also to be regretted that, from the first, the monuments should have proceeded on the principle of occupying the *floor* instead of the *walls* only. The theatrical "gallery" system of church-building, some years ago, led to the remark that the capacity of churches (as regards number of worshippers) was now no longer estimated by the area of the floor, but of the walls. By a similar perversity their capacity to hold monuments is measured not by the walls but by the floor. This arose indeed in the Gothic times, with the altar-tombs and chantries; but narrow selfishness, and a certain microscopic habit of vision, have perpetuated it, till Westminster Abbey has become a sculptor's show-room, in which the conflicting advertisements dispute every foot of standing-room with each other and the congregation. If any one thinks the monuments in St. Paul's have been begun on a different principle, that they harmonize with the building, or display any wider spirit, any community of aim, beyond the self-glorification of each, he is mistaken. Let him consider the appearance of the building when the present system shall have been completed, by lining its whole enceinte with a marble population, clustered against the basis of every pillar and wall, encumbering the floor as with the debris of a cavern, and leaving the naked fabric to rear, above the battling throng of pigmies, its vast bald surfaces and empty panels; let him contrast this with the aspect of St. Peter's, holding, uncrowded, and with harmony, more monuments than the floor of St. Paul's would contain, and he will see the immense difference in the ultimate results of the public-spirited and private-spirited methods of design,—that which makes the whole more important than the part,—or the part more important than the whole.

The best time and place for entering and viewing this building is from the south door, within an hour of noon, in a clear day of summer, but not in the months of May or June, as, during great part of them, the dome and nave are filled with the rough scaffolding for a spectacle which takes place usually about the beginning of June, and should not be missed if possible by any visitor to London. The whole of the charity children of the capital, amounting often to 9000, are placed in a temporary amphitheatre under the dome, left open towards the central nave, which is fitted with rising seats for the spectators, extending up to the west door. The whole of the children sing several portions of the service. There is a rehearsal two days before this festival, to which the public are admitted by payment of 6*d.* each, and to the principal service itself by tickets, of which all the metropolitan clergy have a certain number to give. This is at present the only occasion on which the cathedral can be entered from the west, though we have it on Wren's own authority that the *side* west doors were intended for daily use, and only the *centre* one to be reserved for solemn occasions. (For the architecture of this edifice see pages 181 to 191.)

There are three daily services in this cathedral, at 8, A.M.; 9 45, A.M.; and 3 15, P.M.; and sermons every Sunday and holiday, and every Wednesday and Friday in Lent. At other times (during daylight) 2*d.* is demanded for entering the church, and always for entering the nave. No one should leave the building without ascending, on a fine day between May and September, and between noon and 3 P.M., to the lantern; the base of which is accessible for 6*d.*, and the top, as high as the gilt ball, for 1*s.* 6*d.* more. The ascent throughout is internal, safe, and easy; and the view from either of the above-named points (at the time mentioned) the only one that can give any idea of London as a whole. The "whispering gallery" (over the first circular cornice within) and the "stone gallery" (on the top of the external colonnade) are also free to all who ascend to the lantern; and the latter of these affords the best possible view of Wren's many ornaments to the city. The library over the south-west chapel, the adjoining tower, with its "geometrical staircase," the west gallery (commanding a grand view of the interior), and the room over the north-west chapel (containing Wren's model and various trophies), are to be visited for 1*s.* extra, by those who ascend to the lantern. The clock and great bell (not accessible very near) are an extra 2*d.* The crypts are to be seen independently for a charge of 1*s.* They contain, in the exact centre, the tomb of Nelson; at the east end, a few relics of the old cathedral; and elsewhere the graves of many illustrious men, chiefly dignitaries of the cathedral, and artists. The sarcophagus over Nelson was originally prepared for himself by Cardinal Wolsey.

CHRIST'S HOSPITAL, *Newgate Street.*—A school for poor fatherless children and foundlings, which we owe to the truly princely beneficence of the pious Edward VI., who completed its foundation on June 26, 1553, only ten days before his premature death. It occupies the site of the Monastery of Grey Friars, and contains a slight relic thereof in a row of arches, formerly a cloister, on the south side of the principal quadrangle. The parts built in the reigns of Edward and his sisters have all been restored, and are not now distinguishable from the modern additions, which all affect the style (if such it can be called) of that period, except the Great Hall (the building seen from Newgate Street), which is a well-proportioned Gothic work, very creditable to its designer, John Shaw, and was built between 1825 and 1829. The Grammar School (pseudo-Elizabethan) has been added still more recently.

Charles II. founded the Mathematical School, for forty boys, since augmented to fifty-four. They are instructed chiefly in Navigation. The "King's boys" (as those of King Charles's foundation are called) are presented at Court every New Year's Day, and a curious picture in the Hall, by Verrio, represents this ceremony as performed before James II. The Writing School was founded by Sir John Moore, citizen, in 1694.

The whole number of children now educated in this vast establishment seldom falls short of 900, exclusive of the younger ones, who are kept in a preparatory branch at Hertford, usually to the number of 500. The expenditure is not less than 40,000*l.* per annum. No boy is admitted under seven or over nine years of age, and none can remain after he is fifteen, except he be one of the forty "King's boys," or have attained to the highest class in the school, called "Grecians." The second class are called "Deputy Grecians," who also enjoy some privileges. On every Easter Monday, the London scholars visit the Royal Exchange; and on Tuesday, the Lord Mayor, at the Mansion House. They also sup in public every Sunday in Lent, when strangers are admitted into the great Hall, by tickets to be obtained from the Governors and others connected with the school. Most of the quaint old customs, however, are gradually disappearing, except the bare head and curious costume (from which the name Blue Coat School is derived). "When the dress is once done away with," says a late writer, "the Hospital will sink into a common charity school." On the contrary, we fear such a change would render it no longer a charity school at all, and hope the uncouth dress and bare head will be jealously guarded, as one of the wise barriers set up by the founder against the encroachments of that irresistible power which seems inevitably, sooner or later, to absorb and appropriate to the rich, every patrimony of the poor in this country. It is a melancholy fact, that our boasted and truly unparalleled number of eleemosynary foundations only serve (with one notable exception—the medical and surgical ones) to prove, by failure upon failure, the utter powerlessness of their founders to fence them for any considerable time against a power that, with imperceptible progress, absorbs them as silently and invisibly as a serpent swallows his prey, yet faster than charity can produce fresh ones for the same insatiable devourer.

Early in the present century, some energetic efforts were made at different times, to recover the interest of the poor in this splendid institution, an interest that seems then to have become so completely null that the pride of those who monopolized it had actually erased an inscription on the building, that recorded its objects in language too blunt for their refined taste, "*This is Christ's Hospital where poor Blue coat Boys are kept and educated;*" nor has this inscription, as far as we can discover, been restored. It was found, however, as usual, that those ensconced behind the letter could laugh at the spirit of the law; and whatever return towards the founder's intentions has since taken place is due to no coercion, but solely to moral force and the individual good feeling of the governors, on whom alone it depends whether any or how much of the establishment shall, at any time, be indeed a charity school, or simply a proprietary one. The price of a governorship is 500*l.*, which gives the power of presenting a boy once in three years, for life. A list of all governors who have presentations for the current year is published every Easter at the Hospital. Besides this, the Lord Mayor has two presentations, and each Alderman one presentation annually, and also the power of nominating one governor at half-price.

Four boys yearly are sent to the universities, and there are two scholarships of 30*l.* each, founded by the Pitt Club, and the proprietors of the *Times* newspaper. Girls are no longer educated, as formerly, in the chief establishment, but only at the Hertford branch, where there are about seventy.

The great hall contains several interesting portraits, and in the counting-house is one of the founder, supposed to be by Holbein.

Coal Exchange, *Lower Thames Street.*—A building lately erected (during 1848–9), and one of the most singular that any age or country has produced. Its plan is well contrived, making use of the whole of a very confined site, and consisting of four stories of offices surrounding a central hall with an iron domical skylight, and with the entrance well arranged in the angle between the two streets. In everything relating to decoration, however, the object of the designer seems to have been, by breaking or contradicting all possible acknowledged rules of taste, to persuade us either that art has no principles, or that no rules yet laid down have any foundation in truth. Whichever be the aim, we are convinced that this bold attempt will entirely fail of attaining it; and that, however complacently the public taste of England, long utterly perverted, may gaze upon its marvellous eccentricities (as it did on the less extravagant ones of Adams and Soane in their day), foreigners of real taste and observation will see in this building the most melancholy instance yet displayed of the state to which a once noble art may, by centuries of abuse, neglect, and false principles, be at length reduced.

The public are not admitted to the ground floor, but freely to the three galleries, from which all the decorations are well seen. You need not be alarmed at the unstable appearance of the hand-rail, as the apparent ropes are really stiff and firm iron (such is the perfection now reached in the most difficult representations). Indeed by the assistance of cast-iron such miracles of architecture may be exhibited, that Michael Angelo's boast about "a dome in the air" can now excite only ridicule, for in this and our railway structures, we may see the most massive features of building, rustic basements and foundations, apparently in the air. The interior of this building was painted by Mr. F. Sang with appropriate arabesques, which should be seen before the coal smoke renders them unintelligible, as they are well worth inspection, and illustrate, by views, portraits, and still life, the natural and commercial history of this important mineral. The uncouth objects in the panels of the dome represent magnified fragments of the chief fossil plants composing the coal beds. The floor is inlaid with a great variety of English woods, many of which were growing a few weeks before being used, their seasoning being effected by the new process of exposure to a current of dried air. In the vaults is a Roman hypocaust left as it was discovered in digging the foundations.

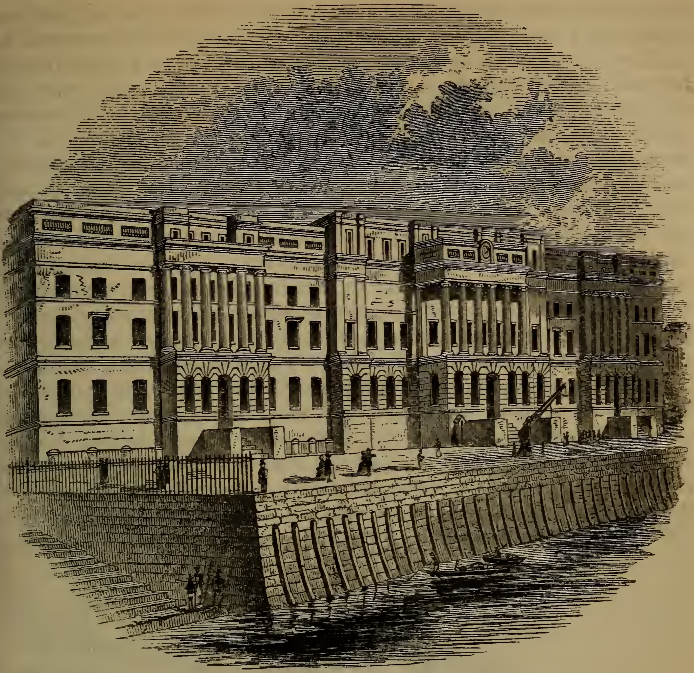
College of Surgeons, south side of *Lincoln's Inn Fields.*—This Royal College was incorporated in 1800. The stone portico of the present building remains from an older one, but the rest was rebuilt in 1835 from a competition design by C. Barry, R.A. It is composed of "artificial stones," *i.e.*, cast blocks of concrete and stucco, and the projection of the cornice is not a little remarkable for a structure so composed. (See article "Learned Societies.") The *Museum* is an enlargement on one left by John Hunter, in 1793, and bought by Parliament for 15,000*l.* It may be seen by the personal or written introduction of a member of the college, between 12 and 4 o'clock, on every day but Friday and Saturday, in every month but September. It contains about 23,000 objects, and is divided into two departments, the physiological and pathological, or those of normal and of abnormal structures. Among the former is a fine specimen of the great Irish fossil elk, larger than that in the British Museum; and among the latter that of the gigantic elephant Chunee, formerly exhibited in London, and shot in 1826, on account of his violent madness, caused, as it now appears, by a disease of the interior of a tusk. He did not die till he had received 100 musket bullets. Here are also the diseased intestines of Napoleon; and the skeletons of several remarkable giants, dwarfs, and monsters, human and animal.

Colosseum, *Regent's Park*, with a back entrance from *Albany Street.*—The most considerable building erected in London for public shows, and therefore not inaptly named, though unfortunately; as the comparison with its huge and substantial namesake was uncalled for by the most distant resemblance of form, and must raise expectations in strangers, only to disappoint them. The chief portion and that first built, in 1824, is a domed rotunda, 120 ft. in diameter, and the same in height, to which is attached on the west an entrance portico, so that the whole resembles a miniature of the *Pantheon*, except that the portico is Doric, with only six columns, which are said to be exact full-sized models of those of the *Parthenon;* but the reduction of the eight-columned to a six-columned façade, without making any other change in the proportions, has destroyed the symmetry; and, as usual, the stripping this sublime style to a bare skeleton, the representation of this denuded remnant in plaster sham grandeur, and then its prostitution to the purpose of a show, has exceeded the true bounds of the burlesque, and altogether failed to please.

The rotunda was intended for exhibiting a truly admirable panoramic view of London, taken from the top of St. Paul's, the sketches by a Mr. Horner, who projected the speculation, but was ruined by it, and the painting by Mr. E. T. Parris. This most elaborate work (presenting the rare combination of minute detail with a truth of effect amounting to deception) is now hidden by other panoramas changed about once in two years, the present one representing the Lake of Thun. There are a variety of other scenic arrangements well worthy a visit, and the apparent extent given by them to a very small piece of ground is remarkable. Round the ground floor of the rotunda is a gallery of casts of sculpture, and in the new building next Albany Street, an extremely elegant and classic room for exhibiting cycloramas, or moving landscapes, of which the present represents the Tagus from its mouth to Lisbon. (See also "Panoramas.")

Crosby Hall, *Bishopsgate Street.*—The Dining-Hall of Crosby Place, the only Gothic private mansion of which any remains exist in London. It has been described under "Architecture" (pp. 160 to 162). The cellars, of brick, are probably some of the first English structures in that material, which was not introduced till the reign of Edward IV. For a century after Sir John Crosby's death, this house continued in private hands, but from 1576 to 1590, was used for the reception of ambassadors, and as long as it stood entire, seems to have been considered the finest dwelling in the city. In 1672 the Hall became a chapel, and at present, after many changes, is still used for public meetings. The reconstruction of the ends of the Hall, and addition of modern Gothic works, took place between 1836 and 1842. Neither these nor the old parts are visible from the street, being concealed by houses and shops.

Custom House, between *London Bridge* and the *Tower.*—The sixth building for the same purpose, on this site. There was one before 1385, when it was rebuilt by John Churchman, sheriff. The Custom House destroyed in the Great Fire was the third, and that which Sir C. Wren built to replace it, was destroyed in the same manner in 1718, and was rebuilt by Ripley, who supplanted him in the office of surveyor-general, and whose Admiralty still disfigures Whitehall. This structure escaped longer than any of its predecessors, but fell before a similar calamity in 1814; to be replaced by the present huge pile, which (it will perhaps hardly be believed) is constructed on precisely the same bricklayer's routine, just as liable as ever to another conflagration. The foundations being defective, the



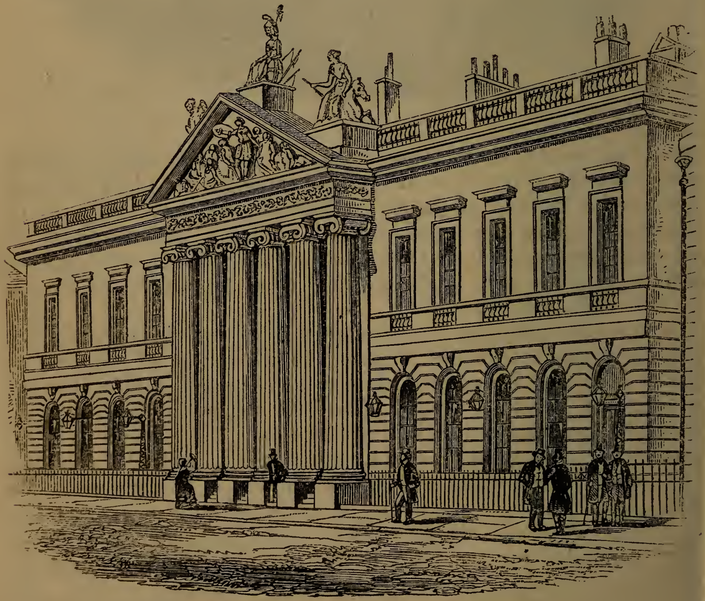
THE CUSTOM HOUSE.

central parts were again taken down and rebuilt by Sir R. Smirke, who gave the river front its present appearance. The principal room, called "the Long Room," is well proportioned, 190 ft. by 66, covered by three low cupola-shaped ceilings. The extent of the whole building is 490 ft. by 108. The quay is almost the only river-side walk in London open to the public. (See also article "Customs," p. 114—123, and 297—339.)

The revenue collected here amounts to nearly half that collected from customs throughout Great Britain. In illustration of the increase in this branch of the revenue, it may be mentioned that in the reign of Elizabeth, it did not average above 70,000*l.*, in the Commonwealth 316,000*l.*, and at present about 20,000,000*l.* The customs were formerly farmed, like turnpike tolls, by private persons, called "Customers."

Diorama, *Park Square*, *Regent's Park.*—A building erected in 1823, for exhibiting two dioramic views in the same manner as those at Paris. They are changed nearly every year, and are generally very admirable for the truth of the changing effects of light and colour, in producing which natural light is exclusively used. The pictures are suspended in separate rooms, and a circular room containing the spectators is turned round, much like an eye in its socket, to admit the view of each alternately. (See article "Panoramas.")

East India House, *Leadenhall Street.* — For a Company that governs 100,000,000 of people, maintains armies, and makes war with the greatest Asiatic powers, this is but a humble and unpretending edifice. It was erected by R. Jupp, Architect, in 1800, just 200 years after the first incorporation of this extraordinary Company, and has been since enlarged at various times. Its front, though belonging to a very hackneyed class, a mere portico with wings, is one of the best of its kind; but cannot be appreciated, from the narrowness of the street, and the northern aspect—a disadvantage that seems by a sort of fatality to attend all our best architecture. It is much to be regretted that the exteriors of buildings should no longer be designed, as formerly, with some reference to the aspect and other circumstances of the site. The pediment was sculptured by the younger Bacon, and represents, in the centre, Britannia and Liberty, to whom, from the east side, Mercury and Navigation are introducing Asia. On the other side appear Order, Justice, Religion, Integrity, and Industry. The recumbent figures in the extreme angles are the Ganges and the Thames; the finials over them, Asia and Europe; and that on the apex, Britannia. The building contains a museum of eastern curiosities, which is open to



THE EAST INDIA HOUSE.

the public every Saturday from 11 to 3 o'clock; and to those who obtain a director's order, on Mondays and Thursdays also; but is closed during the month of October. It contains some remarkable works of rude art and industry, as Chinese ivory carvings, Brahman and Buddhist idols and mythological paintings, armour, and trophies. Tippoo's organ, representing a tiger devouring an European, is very curious. The music, produced on turning the handle, consists of shrieks from the man, after every four of which, comes a growl from the beast. In fine contrast with this truly barbaric piece of royal furniture, is a specimen of Roman art found under the site of the present building, and representing, curiously enough (in tessellated work), a female riding on a tiger. There are also here a collection of fossils, a very rich library of Oriental MSS., and several portraits and statues of the most eminent servants of the company.

EXCISE OFFICE, *Old Broad Street.*—This building occupies the site of old Gresham College. It was built by James Gandon, Architect, about 1765, and presents nothing remarkable, except being mounted on two basements ridiculously exceeding in height and importance the superstructure for which they seem meant to prepare us. There is a thoroughfare through the quadrangle to Bishopsgate Street.

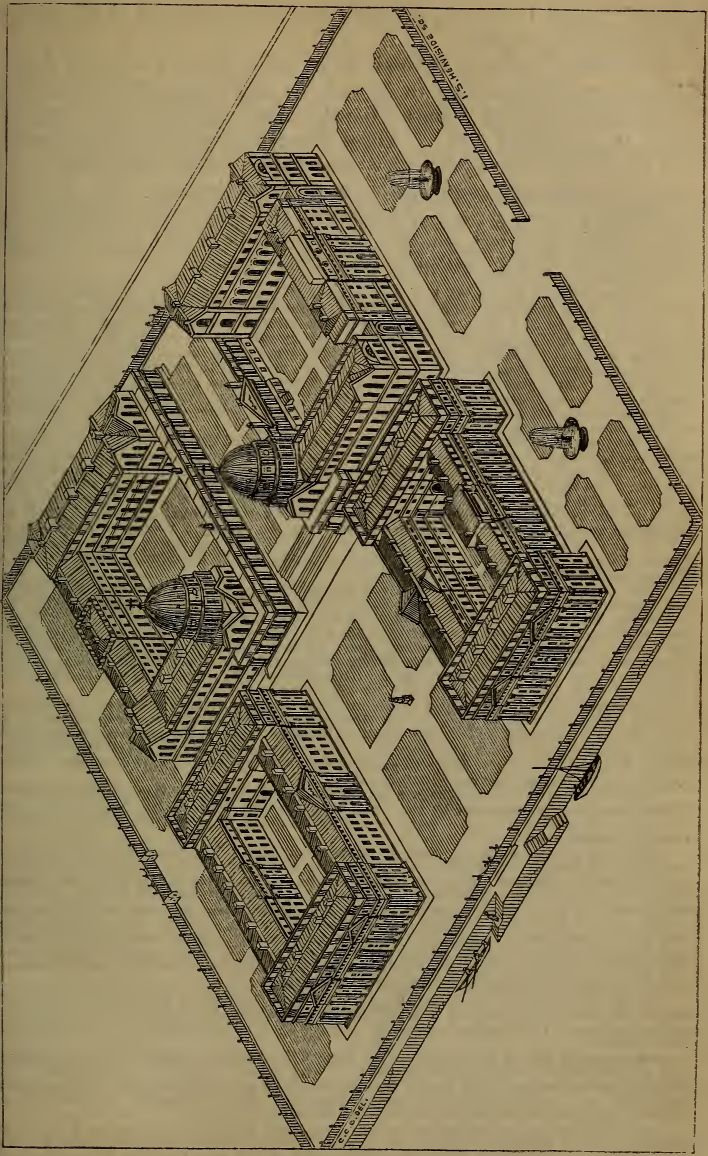
FISHMONGERS' HALL, north-west of *London Bridge.*—The most modern of the halls of civic corporations, and that which makes the most architectural pretensions. It replaces one built by Wren, and was erected in 1833. It has the advantage of one of the very best sites in London, and three open façades, a more united and simple treatment of which (especially the eastern one) might have made it a very noble building. The loss of such an opportunity is to be regretted, no less than the fate which consigns our finest structures to obscure holes and corners. Being one of the last of what are called Grecian buildings (if we except the sumptuous mask before the British Museum), this Hall displays well the peculiarities of that singular fashion. It will be seen that their Hellenism consists solely in the use of an order and other details from a Grecian pattern, stripped of all its embellishments, and stuck against the walls of a modern "box." The opposition of principle to everything Greek is so complete, that, while it is a peculiarity of the Greek architecture to contain no mock-features, the pseudo-Greek exhibits no other than mock-features.

The Fishmongers' Company ranks fourth among the twelve who have the title "Honourable." It has a charter of the time of Edward III., and boasts among its members Sir William Walworth, the gallant Lord Mayor who dispatched Wat Tyler. There is a statue of him in their Hall, together with several royal portraits, and a very curious and rich embroidered pall of the time of Henry VIII. The Company consists of about 1400 members. (See "Corporation," p. 335.)

ST. GEORGE'S HOSPITAL, *Hyde Park Corner* (see "Hospitals").

Goldsmiths' Hall, *Gresham Street*, at the back of the *Post-Office.*—The finest of the buildings of the London companies, rebuilt in its present form by Philip Hardwicke, R.A., at the same time that the Fishmongers' new Hall was in progress, 1833–4. This structure is nearly square, and stands quite isolated, with four fronts; but there is not sufficient space for any one of them to be well seen. They possess much unity and completeness, contrasting strangely with the excessive meanness of the adjacent Post-Office, which, with a similar exposure, turns all its pretension one way. The interior is finely arranged, and its principal apartments, are equally handsome. They are to be seen only by an order from a member of the Guild. This Company ranks fifth among those of London, and is one of the oldest, having been incorporated in 1327. Among its members were Henry Fitz Alwyn, first Lord Mayor of London (from 1190 to 1214), and Sir Hugh Myddelton, the famous originator of the New River. The building contains a portrait of him, and several other portraits, including the sovereigns since George II., by celebrated hands. All articles of gold or silver must be assayed and stamped by this Company, and about 150 are assayed here daily. A jury of them are also entrusted with the examination of the coinage, called "the trial of the pix," which is performed in that Saxon building adjoining Westminster Abbey cloisters which was noticed under "Architecture" (p. 127). The original stamp required by the act of Edward III. was a leopard's head, to which are now added three others, a lion, the sovereign's head, and a letter corresponding to the year of the reign. Articles containing more than a certain amount of alloy are forfeited.

Greenwich Hospital.—This magnificent institution was founded by William and Mary, in 1694, for maintaining, lodging, and clothing 300 maimed seamen, a number which has since increased to 3000, independently of about 32,000 out-pensioners. The royal founders were assisted by private contributions to the extent of 60,000*l.*; and made use of the unfinished palace begun for Charles I., from a design of Inigo Jones, to which were added two beautiful quadrangles by Sir Christopher Wren (superintended gratuitously), and, in Queen Anne's reign, a repetition of Jones's original building; the whole four now forming an architectural group unparalleled in modern England. Lastly, the forfeiture of the Earl of Derwentwater's estates on account of the rebellion of 1715, and their appropriation to this Hospital, brought it an accession of about 6000*l.* per annum, to which have been added numerous private donations. The Hospital now contains a very large additional number of inmates; and the officers consist of a governor, lieutenant-governor, eight lieutenants, four chaplains, and about 170 nurses. The in-pensioners receive, besides every necessary, from 1*s.* to 2*s.* 6*d.* per week, and the out-pensioners from 4*l.* 11*s.* 3*d.* to 27*l.* 7*s.* 6*d.* per annum, according to their rank, age, and the nature of their wounds. The buildings having been described under "Archi-


I. S. HEAVISIDE SC.
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GREENWICH HOSPITAL.

tecture" (pages 179, 180), we need only here notice the chief objects of interest they contain.

The hall or gallery, entered from under Wren's western dome, with the vestibule leading to it, and the small upper hall beyond it, were painted by Sir James Thornhill, and occupied him nineteen years, from 1708 to 1727. These decorations are fast disappearing, and could never have been very remarkable. The shadowing to represent architecture and sculpture in relief betrays (like all false pretences) at once a want of invention, and a most mean and tawdry taste, which, however, was the universal fault of the age. The decorations are thus described by Sir Richard Steele:—

> "In the middle of the ceiling is a very large oval frame, painted in imitation of carved gold, with a great thickness rising in the inside, to throw up the figures to the greater height; the oval is fastened to a great suffite, adorned with roses, in imitation of copper. The whole is supported by eight gigantic figures of slaves, four on each side, as though they were carved in stone. Between the figures, thrown in heaps into a covering, are all manner of maritime trophies, in mezzo-relievo, as anchors, cables, rudders, masts, sails, blocks, capitals, sea-guns, sea-carriages, boats, pinnaces, oars, stretchers, colours, ensigns, pendants, drums, trumpets, bombs, mortars, small arms, grenades, powder barrels, fire-arrows, grappling-irons, cross staves, quadrants, compasses, &c., all in stone colours, to give the greater beauty to the rest of the ceiling, which is more significant.
>
> "About the oval in the inside are placed the twelve signs of the Zodiac: the six northern signs, as Aries, Taurus, &c., are placed on the north side; and the six southern signs, as Libra, Scorpio, &c., are to the south, with three of them in a group, which compose one quarter of the year. The signs have their attitudes and their draperies varied and adapted to the seasons they possess, as the cool, the blue, and the tender green to the spring; the yellow to the summer; and the red and flame-colour to the dog-days and autumnal season; the white and cold to the winter: likewise the fruits and flowers of every season, as they succeed each other.
>
> "In the middle of the oval are represented King William and Queen Mary, sitting on a throne, under a great pavilion, or purple canopy, attended by the four cardinal virtues, as Prudence, Temperance, Fortitude, and Justice.
>
> "Over the Queen's head is Concord, with the fasces; at her feet two doves, denoting mutual concord and innocent agreement; with Cupid holding the King's sceptre, while he is presenting Peace with the lamb and olive branch, and Liberty, expressed by the Athenian cap, to Europe, who, laying her crowns at his feet, receives them with an air of respect and gratitude. The King tramples Tyranny under his feet; which is expressed by a French personage, with his leaden crown falling off—his chains, yoke, and iron sword broken to pieces—cardinal's cap—triple-crowned mitres, &c., tumbling down; and at one end of the oval is a figure of Fame descending, sounding forth the praises of the royal pair.
>
> "Just beneath is Time bringing Truth to light; near which is a figure of Architecture, holding a large drawing of part of the Hospital, with the cupola, and pointing up to the royal founders; attended by the little Genii of her art. Beneath her are Wisdom and Heroic Virtue, represented by Pallas and Hercules: they are represented in the act of destroying Ambition, Envy, Covetousness, Detraction, Calumny, with the other vices, which seem to fall to the earth, the place of their more natural abode.
>
> "Over the Royal Pavilion is shewn, at a great height, Apollo in his golden chariot, drawn by four white horses, attended by the Horæ—the morning dews falling before him—going his course through the twelve signs of the Zodiac; and from him the whole plafond, or ceiling, is enlightened.
>
> "Each end of the ceiling is raised in perspective, with a balustrade and elliptic arches, supported by groups of stone figures, which form a gallery of the whole length of the hall—in the middle of which gallery, as though on the stocks, is seen the tafferil of the *Blenheim* man-of-war, with all her port-holes open, &c.; to one side of which is a figure of Victory flying with the spoils taken from the enemy, and putting them on board the English man-of-war. Before the ship is a figure, representing the City of London, with the arms, sword, and cap of Maintenance, supported by Thame and Isis, with other small rivers offering up their treasures to her: the river Tyne pouring forth sacks of coals. In the gallery, on each side of the ship, are the arts and sciences that relate to navigation, with the great Archimedes, and many old philosophers, consulting the compass, &c.
>
> "At the other end, as you return out of the hall, is a gallery in the same manner, in the middle of which is the stern of a beautiful galley, filled with Spanish trophies; under which is the Humber, with his pigs of lead—the Severn with the Avon falling into her—with other lesser rivers.
>
> "In the north end of the gallery, is the famous Tycho Brahe, that noble Danish knight, and great ornament of his profession and of human nature. Near him is Copernicus, with his Pythagorean system in his hand; next to him is an old mathematician, holding a large table, and on it are described two principal figures of the incomparable Sir Isaac Newton, on which many extraordinary things in that art are built.
>
> "On the other end of the gallery, to the south, is our learned Mr. Flamstead, Reg. Astron. Profess., with his ingenious disciple, Mr. Thomas Weston. In Mr. Flamstead's hand is a large scroll of paper, on which is drawn the great eclipse of the sun, that will happen in April, 1715; near him is an old man with a pendulum, counting the seconds of time, as Mr. Flam-

> stead makes his observations with his great mural arch (circle) and tube, on the descent of the moon on the Severn (which at certain times forms such a roll of the tides, as the sailors corruptly call the Higre, instead of the Eager, and is very dangerous to all ships in its way; this is also expressed by rivers tumbling down, by the moon's influence, into the Severn). All the great rivers at each end of the hall have their proper product of fish issuing out of their vases.
>
> "In the four great angles of the ceiling, which are over the arches of the galleries, are the four elements; as fire, air, earth, and water, represented by Jupiter, Juno, Cybele, and Neptune, with their lesser deities accompanying, as Vulcan, Iris, the Fauni, Amphitrite, with all their proper attributes, &c.
>
> "The whole raises in the spectator the most lively images of glory and victory, and cannot be beheld without much passion and emotion."

This room did not long serve its original purpose of a dining-hall. It remained useless for more than a century, till, in 1823, it was made a gallery of naval pictures as we now see it. Thirty-eight portraits of admirals were then presented by George IV. and William IV. The rest of the paintings have been contributed chiefly by private persons.

Henry VIII. sailing to Calais to confer with Francis I.; D. Serres.
Sir Walter Raleigh; after Zucchero.
Defeat of the Spanish Armada; De Loutherbourg.
Battle of Southwold Bay; not known.
Battle of Barfleur; R. Paton.
George, Prince of Denmark; Sir G. Kneller.
Sir E. Hawke's Victory in Quiberon Bay, 1759; Dominic Serres.
Taking of Porto Bello, in 1739, by Admiral Vernon; G. Chambers.
Death of Captain Cook, the celebrated Circumnavigator; J. Zoffany.
Sir S. Hood's Engagement with the French Fleet, 1782; N. Pococke.
George III. presenting a Sword to Lord Howe; H. P. Briggs.
Sir J. Jervis's Victory off Cape St. Vincent; G. Jones.
Lord Viscount Hood; after Gainsborough.
Admiral Duncan's Victory at Camperdown; S. Drummond.
Admiral Kempenfelt, lost, with most of his crew, at Spithead, in the Royal George; T. Kettle.
Sir T. Hardy, Governor of the Hospital; G. Romney.
Lord Viscount Bridport; Sir J. Reynolds.
Lord Nelson's Victory at the Nile; G. Arnald.
Death of Lord Nelson; A. W. Devis.
Bombardment of Algiers by Lord Exmouth; G. Chambers.
Lord Collingwood; Henry Howard.
Rear-Admiral Sir E. Berry; J. S. Copley.
Captain Kempthorne attacked by Pirates; not known.
John Worley, aged 97, one of the first pensioners admitted into the Hospital; Sir J. Thornhill.
View of Old Greenwich Palace; Vosterman.
View of Windsor Castle; Vosterman.
Portrait of Columbus; after Parmegiano.
Vasco de Gama; not known.
Edward, First Earl of Sandwich; Sir P. Lely.

This gallery contains also some exquisitely-finished models of men-of-war. (See also "Galleries of Art," p. 400.)

Corresponding to this in the opposite building, and entered through the other dome, is the chapel, which internally is decidedly the most rich and complete place of worship fitted up in this country since the Reformation. It replaces one equally remarkable, which was destroyed by fire on the 2nd January, 1779, and the present fittings were not finished till ten years afterwards; the architect being James Stuart, the celebrated author of the "Antiquities of Athens," a work that, while it first revealed to modern eyes the surpassing beauties of the Greek architecture, had, by its perversion to the purpose of a pattern-book, the most baneful effect on this art. The antiquarian himself, however, has here made a very different use of his discoveries, and if we may not venture to call it such an apartment as the Greeks themselves would have produced under similar circumstances and requirements, it is at least the only English work which can pretend to resemble theirs at all in general spirit and character.

The four statues in the vestibule were designed by West, and personify Faith, Hope, Charity, and Meekness. The portal is the only really rich one since that of Henry VII.'s Chapel, and its principal sculpture is by Bacon. The proportion of the chapel is too low, a defect that might have been corrected by pillars, but at the expense of convenience and capacity. It accommodates 1400. The galleries hardly injure it, having been provided for as part of the design. Why should they not be so in all churches where they are known to be required? Why should they be always now a hideous unforeseen excrescence, even when erected along with the rest of the building? Among the numerous decorations, all of which are worthy of notice, there is, over the lower windows, a series of monochrome paintings, illustrative of the Gospel history, beginning at the south-east corner and proceeding round to the north-east. The first four are by De Bruyn (1, the Nativity; 2, the Shepherds; 3, the Magi; 4, the Flight into Egypt): the next four by Cotton (5, the Baptism of John; 6, the Calling of Andrew and Peter; 7, our Lord preaching from a Ship; 8, stilling the Tempest): the next four, beginning from the north-west corner, by Milburne; (9, our Lord and Peter walking on the Sea; 10, healing the Blind; 11, the Raising of Lazarus; 12, the Transfiguration): and the last four by Rebecca (13, the Last Supper; 14, the Trial before Pilate; 15, the Crucifixion; 16, the Resurrection). The series finishes with the Ascension, by West, over the altar-piece. Besides much sculpture in marble, the reading-desk and pulpit of lime-tree are remarkable. The former has four alto-relievos, and the latter six, representing subjects from the Acts: 1, the Conversion of St. Paul; 2, the Vision of Cornelius; 3, the Release of St. Peter from Prison; 4, Elymas struck Blind; 5, St. Paul before the Areopagites; and 6, before Felix. The communion-table, of marble, is a very original and graceful design, and over it is a picture, by West, of St. Paul's Reception by the Islanders of Melita, very appropriate to the destination of the building.

These two fine apartments are accessible to the public for a small charge every day, and on one day of the week free. The rest of this vast institution is remarkable for extreme neatness and order.

GREENWICH NAVAL ASYLUM or SCHOOL, situated south of the Hospital, and dividing it from the park, maintains and educates 1000 children of both sexes, the orphans of naval men. The buildings have nothing remarkable, except a very long Tuscan colonnade for exercise in wet weather. It needlessly apes the splendid colonnades of the Hospital, and by being placed symmetrically with that fine edifice, as if forming part of one great design, it is made to appear both mean and shabby in itself, and a blemish to the whole; whereas, if treated as an independent building, and placed without reference to the Hospital, this school would, however near, and however inferior in style, have provoked no comparison, and inflicted no injury on its magnificent neighbour, any more than adjacent private dwellings do; and would have had its own merit (if any) appreciated, which now is utterly thrown away, since no beauty it may possess can divert attention from the glaring eyesore and wretched anti-climax it presents to the gorgeous avenue of approach. The blunder is such as can hardly be paralleled elsewhere. To have splendid buildings with no approach, and splendid approaches leading to nothing, is a necessary inconvenience wherever fine architecture is but a counterfeit, and therefore common enough with us; but here the grandest vista we have leads to much worse than nothing. Unless or until this spot could have been occupied by some object worthy of such an avenue, *i. e.*, containing more to concentrate attention than any of its accessories (such as either a lofty church or a monument of the first class), it might have been left open to the view of nature's architecture, or at least (if the space could not be spared) be built upon irregularly, so as to put a limit to the symmetrical design, and leave it alone and complete.

GUILDHALL, *King Street*, *Cheapside*.—The seat of the municipal government of the city, and the chief room for its civic meetings. This Hall was commenced in 1411 by the contributions of the several companies called Guilds, aided by those of many liberal individuals, and, like most mediæval buildings, was progressively enriched and adorned by such contributions, till the final extinction of mediæval art; and since that time, has been patched and kept together by rude makeshifts, which (while destroying all its beauty as a whole) leave vestiges enough to join in the mute but trumpet-tongued cry of every old stone, and (though themselves belonging to a declining state of art) to speak, as clearly as Athenian marbles amid Turkish plaster, of past refinement and present degradation,—of the sterling grandeur and polish of an age that boasted of neither, and the squalor and second barbarism of one boasting of everything.

This building (see "Architecture," pages 158, 159) is now entirely surrounded and concealed by modern adjuncts, which are fronted on the south, the only exposed side, by the intensely barbarous façade of Dance, erected in 1789; it contains a library and museum of city antiquities, entered from the porch, and a council-room and courts of law, beyond the Hall, which is always open as a passage to them. Here are held the city courts, nine in number; and the courts of Exchequer, Queen's Bench, and Common Pleas are also held here on certain days, four to each term. These apartments contain some paintings of no remarkable merit, an account of which was given under the article "Galleries." They are chiefly portraits; also the siege of Gibraltar, by Copley, R.A., and the Death of Wat Tyler, by Northcote, R.A.; a statue of George III., by Chantrey; a bust of Granville Sharpe, by the same; and one of Nelson, by Mrs. Damer. The Hall itself is chiefly used for the Lord Mayor's banquet on the 9th of November, and other entertainments, and for elections. It is disfigured by a ceiling, a wretched substitute for the roof destroyed in the Great Fire; by barbarous ornaments in every fashion, from Wren's

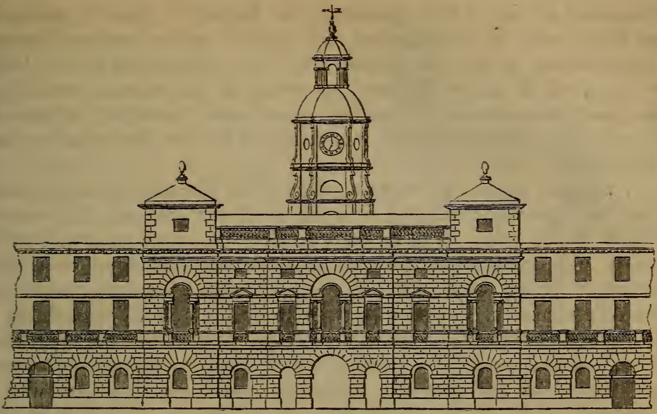
French to Wyatt's Gothic; by the walling up of all its original side windows and enlargement of the end ones; and lastly, by four hideous piles of marble, fit for no place.

The speech on Beckford's monument is said to be the only one George III. allowed to be addressed to him without having been first approved in writing. It is disputed, however, whether it was ever spoken. Of the other inscriptions, which are somewhat curious, that to the great Pitt was written by Burke, that to the younger Pitt by Canning, and that to Lord Nelson by Sheridan. The two remaining works of art, called Gog and Magog, are quite in keeping with the modern portions of the architecture. Nothing is known of their meaning or intention, but that similar figures were formerly drawn on cars in the Lord Mayor's pageant, and kept here during the rest of the year. In the fifteenth century, living giants seem to have been thought essential as champions, to meet or accompany royal and other grand processions. By degrees, the difficulty of always procuring "a mightie giant" led to the introduction of these substitutes, and at length even they became fixtures, so that the present pair (which were carved in 1708) were not even made capable of such transport, being entirely of wood glued together.

Hall of Commerce, *Threadneedle Street.*—A building erected in 1843, by Mr. Moxhay, formerly a biscuit-baker in the same street, and intended as club and reading-rooms, &c., for merchants, to be supported by a small annual subscription. It has not, however, been a successful speculation, and is consequently used for various purposes. The whole was designed by the proprietor, and is in very good taste. There is a sculptured frieze on the front, and a statue of Whittington in the vestibule. The building occupies the site of a French Protestant church which had stood there since the Fire, and in digging its foundations, as in most others in the city, a Roman mosaic pavement was found, which is in the British Museum.

Hope's Mansion, Piccadilly.—A palatial mansion; built by H. T. Hope, Esq., M.P., in 1849–50, with remarkably handsome external decorations in stone and metal, in the modern French style, displaying much fancy. The architects were M. Dusillon and Professor Donaldson; the decorations executed chiefly by French artists. The iron railing is among the richest and best executed to be found in London; the founder, Mons. J. P. V. André, Rue Neuve Menilmontant, No. 12, Paris. The contract price for the casting and putting together was 400*l.* This cost does not include the charge for the carriage and duty. For the works of art noticeable within, see "Galleries, Private" (p. 411).

Horse Guards, *Whitehall.*—A building containing the offices of the Secretary at War, and in which the chief business relating to the army is transacted. It is a very solid structure broken into complex forms, much in the picturesque style of Sir John Vanbrugh, but the name of its designer is uncertain. It was built about 1753.



THE HORSE GUARDS.

Through the centre of this building is a thoroughfare into St. James's Park, for foot passengers only. The clock in the turret is a standard time-keeper for the western parts of the metropolis, as St. Paul's and the Exchange clocks are for the city.

Houses of Parliament, or *New Palace of Westminster.*—The buildings devoted to the legislature of this empire have, till very recently, illustrated, even by their physical exterior, the chief peculiarity of our constitution; for as it is the unique excellence of this, and the main source of its stability, that it has been a work of nature rather than of art; has imperceptibly *grown* up, like a tree, instead of being *erected*, like a building; has never had a definite beginning, nor ever, like the constitutions of less fortunate lands, been planned, constructed, or set going; so has it never till now been enshrined in buildings specially constructed for it. We have done without a Senate-house longer than any other nation that has had occasion for one. Both our legislative assemblies have for centuries been lodged in places never built for them, and have migrated from chamber to chamber, in a monastery or a royal palace. The House of Commons, for almost three centuries after its first assembly by Simon de Montfort, had no other place of meeting than the Benedictines' chapter-room; and then, for nearly three more, the King's disused chapel was made to serve this purpose; while the Lords met in other chambers of his palace, patched up from time to time, as new wants arose. At length the parliamentary buildings had become, in the reign of William IV., a huge agglomeration of fragments of buildings, and sham-buildings, and undesigned excrescences, in every style and fashion, real or assumed—from the noble, truth-seeking, high-motived efforts of the thirteenth-century churchmen, who built not for man's eye, down to the plaster whims and nick-nacks of the "first gentleman in Europe." Never, probably, was there seen so incongruous and patchy, never perhaps so ugly a combination, as all this formed, when the memorable fire of 1834, sweeping off all except the sterling works of the earnest men of old (the chief fragment of which has since been wantonly destroyed), left a field on which England was required for the *first* time to erect a Parliament-house.

In ancient times, if we may judge from the qualities that distinguish their great monuments from those of our own age, the conduct of such works seems to have been divided into three stages, of which neither was undertaken till the previous one had been considered finished. These were, first, the ascertaining or settling what was wanted; secondly, the settling how to do it; and thirdly, doing it. At present, however, it is usual either to reverse the order of these three essential parts of the work, or, at least, to attempt all simultaneously. In this case the modern method has been followed so completely, that, of the first stage, the settlement of the *quœrenda*, only one particular was really decided before commencing the work of designing, or even of executing. This particular regarded the architectural style, which (in the words of the instructions given to designers) was to be "either Gothic or Elizabethan," the former epithet being understood to apply to all English works previous to the Elizabethan. The direction, therefore, amounted to this, that the building was to represent or mimic those of some age (it was not decided which) before the reign of James I.; and the alleged reason for excluding all improvements or supposed improvements in art made since that time, was their universally foreign origin, which, it was thought, rendered it a lowering of the dignity of England to adopt them in a national edifice*. Without inquiring whether such a rule could really be carried out, and such a work composed entirely of native inventions and ideas, as well as of native stone and iron, it may be observed that such never has been the case yet, in any country beyond utter barbarism, from Greece downwards; that notwithstanding the increased intercourse of different countries now, their styles were as *foreign* in the times of their oldest buildings as at present; that without freely borrowing each other's inventions, not one nation would have had its "Complete Gothic;" that our Gothic was quite as foreign a style as any that we have used since; and that if the Tudor fashion imitated in this building be peculiar to England, it is so simply in consequence of its corruptions and debasements. The only things in it that we know to be not imported, are its faults; while every beauty and merit it may have is due to the vestiges it retains of Gothicism—of the European (not the English) style.

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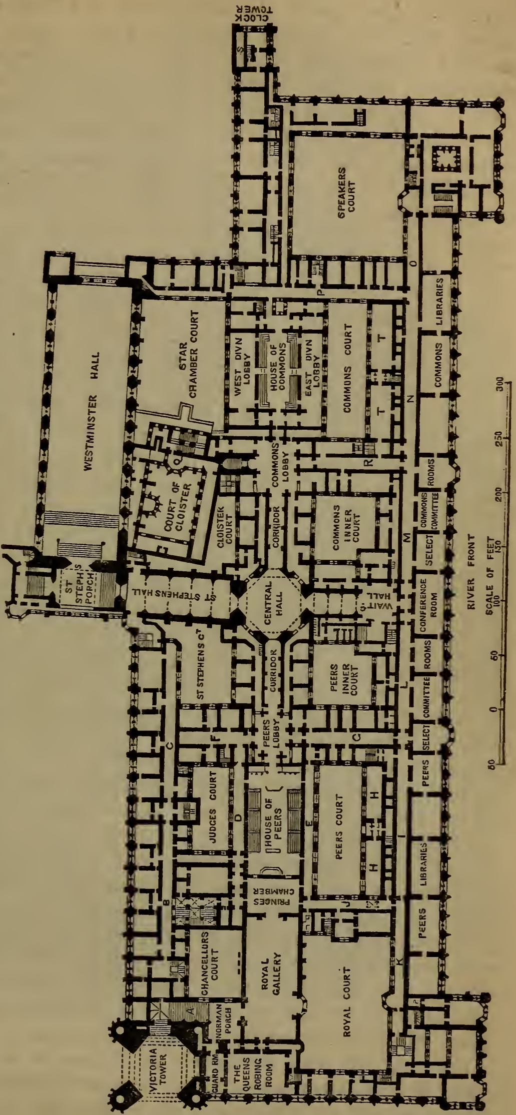
* The resemblance of this bit of pride to that of another very distant and very despised nation is striking. The Chinese, having ceased for some centuries to advance physical science, or useful arts, would not condescend to avail themselves of the inventions of other countries; and we, having ceased for some centuries to cultivate true taste and artistic inventions, now think it beneath our dignity to make use of those made by our neighbours. Are not the cases parallel, putting *fine* for *useful* (in its narrowest sense), and *mental* wants for *physical?*

However, it was settled that, whether the edifice could or could not be *really* exclusively English, it would conduce to national glory that it should at least *pretend* to be so.

With this direction, architects were invited to make designs for the vast structure, without any limitations as to its expense; and it is remarkable that not one was too daring in this respect. The design of C. Barry, R.A., being by far the most magnificent, was at once selected. The style represented is that of Henry VIII.'s time; so that, whatever may be objected to it, we have this comfort, that it might have been worse. We *might* have had an "Elizabethan" senate-house; and, for our escape from it, have only to thank the ninety architects, not one of whom had the ill taste to propose one.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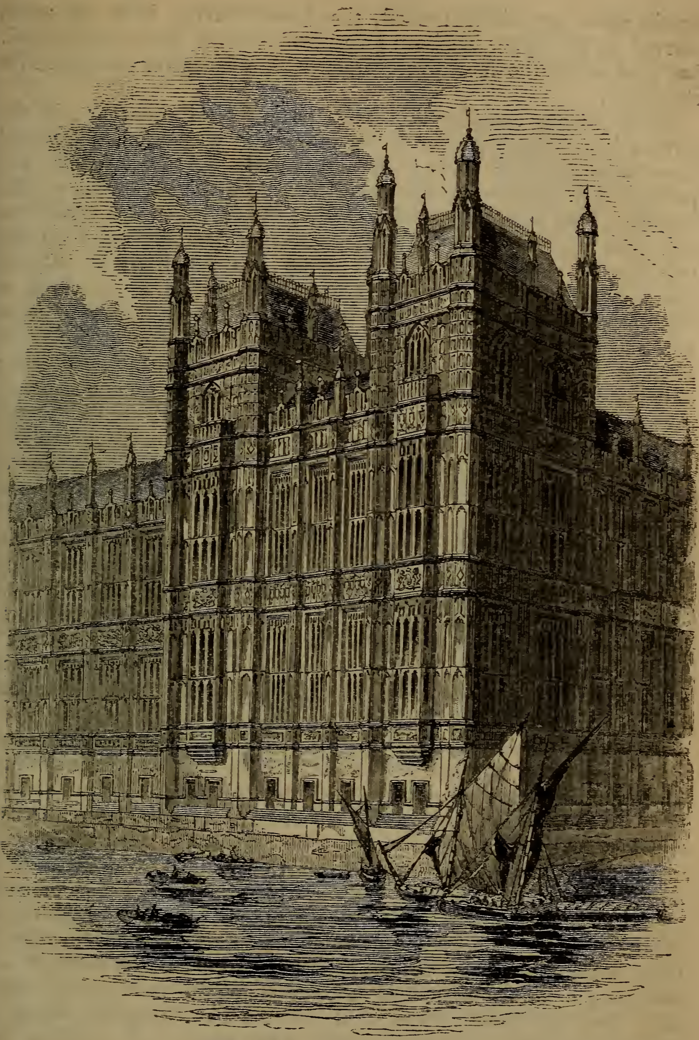
PEERS
CHANCELLORS COURT
ROYAL GALLERY
ROYAL COURT
K
A
NORMAN PORCH
VICTORIA TOWER
GUARD RM
THE QUEENS ROBING ROOM

PLAN OF THE NEW HOUSES OF PARLIAMENT.

The accompanying plan will show the extent of this great edifice (which covers at least twice the site of the old Palace of Westminster, about half the ground occupied being taken from the river), and the arrangement of the rooms on its principal floor, which has undergone but little change during the erection. It is very necessary to observe, however, in justice to the architect and those who chose his design, that hardly a single feature of the exterior now appears as it did on the drawings; and that, unfortunately, it is difficult to find any one of these changes that has not been a serious and important change for the worse. The only part that we can consider improved since its original design is the Victoria Tower, in which a central pillar, originally proposed, has been dispensed with; the entrances made more lofty; and the windows placed in the usual manner, instead of a fanciful arrangement of them on different levels. Every other part of the exterior has been greatly injured by the covering all its surfaces (most of which were designed to be plain) with an endless repetition of the panelling that stood for ornament in the last stage of English Gothicesque building, when mere mechanical work had been substituted for sculpture, or even carving; fritter for richness; repetition for variety; and, in a word, display for genuine excellence and high finish. These panels are, moreover, here more evidently mimic than in most cases, because applied to buttresses and supports (contrary to their use and meaning, which was plainly to lighten loads, not to weaken their supporters); and, besides, while too plain and monotonous to amuse in a *near* view, or appear rich except at a distance, are too shallow to be seen far off. In fact, it is hard to find in them anything to compensate for the loss of the broad unbroken surfaces, solid masses, and largeness of feature in the original design. To understand this, it must be added, that all the buttresses were meant to project much farther than they do, especially in the river front; and that the windows were not at first designed to be, as at present, so many divisions of the general shallow panelling, filled with glass, instead of stone, but deeply recessed and arched apertures. Thus, by a most unhappy coincidence of three or four changes, all perhaps adopted for different reasons, everything that could contribute to the apparent solidity, depth of relief, or quantitative contrast of light and shade, has been either removed or greatly reduced; and the loss of grandeur by these means all conspiring together, particularly in the east front, is hardly conceivable by those who have not much considered it. The same front has further suffered a most important deterioration in the reduction of its terrace or basement to a mere quay, which in the design was graced not only with mouldings and a parapet, but with buttresses as numerous as those above. For want of some such scale, the eye cannot measure or obtain anything like a correct appreciation of its length, and consequently is greatly deceived in all the other dimensions. The same effect arises as when a miniature model is placed on a plain solid block, which



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always renders it more diminutive. The contrast, too, between the extreme plainness of the one and fritter of the other, is too violent. As first designed, they presented a due gradation of increasing ornament, from the water to the sky-line; but now, two distinct bands most oppositely treated, the lower having been as much starved as the upper has been (we were about to say over-enriched, but that is not the fact) overcharged with a deceptive substitute for richness*.

Many persons consider this front too low for its length. If the terrace had formed part of it (as the design promised), this would have added (at low water) nearly a third to the entire height, and perhaps this objection would never have been heard. It is a pity, however, that before choosing or calling for designs, some consideration had not been given to the question (among many others) whether it were preferable to make one flat front of 900 ft. (necessarily very low for its length), or to break it into three or four, separated by recessed courts. Besides the advantage of more noble proportions in each, and that of light and shade (the north sides of these courts receiving the afternoon sun, which can never touch the present surface), there would also have been a constant change of grouping to a spectator passing on the river, the picture varying every moment, and disclosing unexpected combinations, which (as may be observed at Greenwich, and at all great mediæval buildings) satisfies better than a single scene, viewed all at once, and then having nothing more to show. Moreover, by such arrangements generally (leaving the spaces required for light, when possible, partly open to the exterior) the whole would have appeared immensely larger than at present; for two reasons, because affording so many more different views, and because so much would have been visible that is now hidden. There is one advantage, however, in this. It leaves so much the less external surface to be symmetrized and adorned; an important point where the symmetry and ornament are not natural—the splendour but an assumed mask.

It is, doubtless, disappointing to most strangers to find, after viewing this vast and magnificent outer case, that they have nothing more to see, except the principal apartments. There is none of that kind of architecture, intermediate between external and internal, which is so fertile a source of splendour, beauty, or picturesqueness, in the *inclosed courts* of other extensive buildings, even those of a far humbler character, as colleges and convents. A palace of such extent as eight acres is naturally expected (at least by foreigners) to afford, besides the four fronts, some external splendour in one or more large inner areas, at least as ornate as the exterior itself, if not more so (in foreign buildings, and our mediæval ones, *always* more so). But this practice was a relic of the old exploded system of uniting use with ornament in the same object; of building (as

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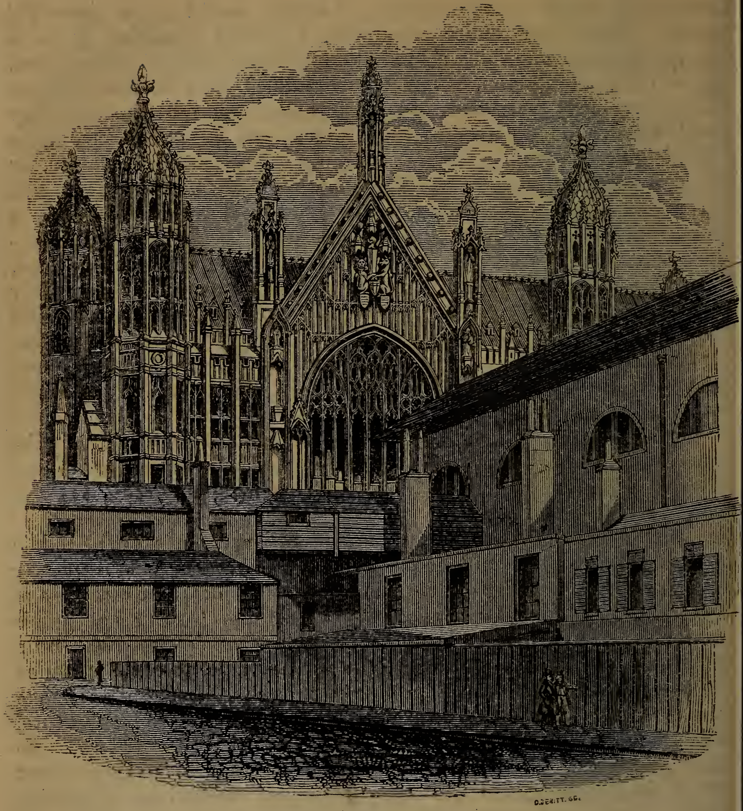
It must add to the regret caused by the injurious nature of the changes made from the original design, to remember that they have increased the expense to nearly thrice its intended amount. No one, however, can complain of the cost, but only of its misapplication; for after all the entire charge will not exceed a fortnight's revenue, or enough to pay the interest of our debts for a month; a sum which, it may be presumed, no one would be mean enough to grudge.

some old writer recommended) "things useful in a beautiful form." Since our entire separation of these qualities, it is a maxim that no one thing should attempt both; and, of course, open areas (like all other members of a building) must be one thing or the other—ugly necessities or useless splendours. In this case they are regarded as the former; and hence, not being (as in Jones's Whitehall, Greenwich, Somerset House, our Gothic colleges, or foreign buildings) any part of the show, they are too small (fourteen in number) and too irregular to be considered worth more than a neat lining of stone, finished in the cheapest fashion that is respectable, viz., the modern castellated. Hence, compared with others, this may be called a palace turned inside outward; and certainly the crowded ornament and shallow relief of the outer fronts would be better fitted to the interior of courts, and better seen there; as, on the other hand, their castle battlements would have more meaning, and their broad surfaces and bold shadowings be more wanted, on the exterior, to suit distant view.

But quære, will not this greatest peculiarity of the work, its richness being *all outside*, be hereafter regarded as a true type of the times of its production?—as giving it the natural stamp of the age and country of *appearances?*

The portions of the interior finished and accessible to the public are the committee-rooms (occupying the greater portion of the river front) and the two legislative chambers, which are in the centres of the northern and southern halves of the building. The general public entrance, when complete, will be through Westminster Hall, up a flight of steps at its south end, into a square vaulted vestibule, called St. Stephen's Porch; thence, turning east, up another flight, and along the "St. Stephen's Hall," a fine passage, but a *very* poor substitute, alas! for the Edwardian chapel it replaces (see pages 151 to 155), into the octagon hall, in the centre of the whole edifice. This is about 60 ft. in diameter, and the same in height, covered by a massive Gothic dome, on which is to be raised a light open stone lantern and spire nearly 300 ft. high, which are an addition to the original design. From hence three passages will branch: that straightforward leading to the centre of the long corridor of the committee-rooms, that on the north to the Commons' lobby and House, and that on the south to the Lords'. These splendid approaches occupy altogether fully fifteen times the capacity of either House. The royal approach (from the great tower at the south-west corner) also fills about thrice the space taken by the House of Lords, and includes, besides robing-rooms, &c., a splendid lobby, about 45 ft. square, and a gallery 110 ft. long, 45 wide, and 45 high, being the largest room in the modern palace. Its decoration is hardly yet begun. That of the House of Lords itself is nearly complete, and it has been used since April, 1847. It may be seen, during the session, on Wednesdays, between 11 and 4, by an order from the Lord Chamberlain



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(which is obtainable at an office near the temporary entrance); or without an order, on the days of hearing appeals, when the House, being a judicial court, is of course open. It is (if not intrinsically, at least effectively) the richest chamber erected since the fall of the mediæval church architecture; a gorgeous effect being produced by gilding all the mouldings (which include the whole of the stone and most of the woodwork), and covering the remaining surfaces with minute coloured patterns. The House is nearly an exact double cube of 45 ft.; the ceiling divided by crossing beams into 18 squares, corresponding to the arched compartments of the walls, which are all similar, except that the six on each side are occupied by windows with coloured devices, and the three at each end by frescoes, a species of painting now first attempted in this country. The three at the throne end are—1, (over the throne,) the Baptism of King Ethelbert, by Mr. Dyce, R.A.; 2, the Black Prince receiving from Edward III. the Order of the Garter, by Mr. Cope, R.A.; and 3, Henry V., when Prince of Wales, submitting to the Authority of Judge Gascoigne, by the same artist. The three at the other end are abstract personations of the principles which these three historical pieces were selected to illustrate; viz., 1, (in the centre, opposite Ethelbert's Baptism,) *Religion*, by Mr. Horsley; 2, (opposite the Institution of the Garter,) *Chivalry*, by Mr. Maclise, R.A.; and 3, (opposite Prince Henry sent to Prison,) *Justice*, by the same. By entrusting the two side pictures of each three to the same artist, any ill effect that might arise from their very different styles of painting is avoided; but it is still to be doubted whether the broad, large-featured, modern style, quite necessary for pictures to be understood at such a distance, agrees with architecture whose broadest surfaces are narrower than the limbs or drapery-folds. All such works in this building will certainly appear *cut out;* an equivalent quantity of architecture being simply omitted to make room for them. This never appears in the old examples of such union of arts; in them, whatever be the style, the architecture and painting seem to form each a *complete* system, never standing in the way of the other. Against the piers separating these frescoes, at the throne end, are statues representing Archbishop Langton and Marshal Robert Fitzwalter; and the sixteen other barons who aided in obtaining Magna Charta will be similarly placed before the other piers all round the House. These, as well as all the external statues, are by one sculptor, Mr. Thomas. The side galleries of this House are appropriated to peeresses; and that at the bar end to strangers, who are admissible only by a peer's order.

The lobby, a cube of about 30 ft., affords a good (though much richer than average) specimen of the internal treatment throughout the building. The ceilings are mostly similar to this, and serve to conceal the substantial coverings, which are fireproof, being of iron beams and brickwork combined in the manner now usual in warehouses; except in the central octagon and neighbouring approaches, where the Gothic vaulting serves at once for both the real and the show ceiling.

The House of Commons was built of the same height and width as the House of Lords, but only 62 ft. long, being reduced to the smallest possible size for the sake of hearing; but as it still did not satisfy on this head, the stone and oaken splendour (similar to that of the other House, but without gilding or colour) has necessarily been hidden, and the architectural character abandoned. It might have been known, without an experiment, that modern architecture could not give us an ornamental House of Commons.

No, for that we must go back to our "barbarous" ancestors—to an age of widely different principles—one that did, without boasting, what we boast of enough certainly, but cannot do. Alas! how humbling would be the contrast could we see the *first* House of Commons, the now dismantled and barbarized Chapter-House of Henry III.'s Abbey. *That* was nothing remarkable in its day; it called for no more than a passing line from a chronicler. Yet it was richer than any vaunted pile in modern Westminster; intrinsically richer in contrivance, in workmanship, in every kind of finish (except those for the luxurious ease of its inmates); richer in amount of labour, mental and manual, contained in a given space. But that is nothing; it was a little richer, but how incomparably more august; for all its richness—*all*, of every kind—was *real.* There was no tinsel, no fair outside-work to hide disgusting realities, no distinction into substantial parts *behind* and show parts *before* them, where all were for use and all for beauty too. The beauties concealed no ugliness, the splendours no meanness, the refinements no rudeness, for there was none to conceal. Nor had the finery to be concealed again, in its turn, by utilitarian makeshifts, for it was *itself* utilitarian, and far in advance of our boasted science—far in advance *practically*. This was because the work was another step added to a series of progressive trials aiming at perfection in the art of *building*, not in that of *counterfeiting* excellent building. For this reason it closely resembled contemporary works at Salisbury, Lichfield, Wells, &c., but it counterfeited no style. It belonged, indeed, to a style, but because it was an improvement on works of the same kind, not quite so excellent, lately erected; not a limping "in base imitation" after works of a different kind, far more excellent, erected centuries before. No, its style and its beauty and richness were its own—they were paid for—they were thought for. They were intrinsic, and belonged to the structure, not to the structure-hiders. They were the results of excellent, refined, and scientific modes of construction; not of an outward clothing in the *appearances* of such results, to hide the clumsy rudeness of a thought-grudging age, for which those modes themselves were too refined, scientific, and troublesome. The splendour and beauty were no mask; and therefore they clashed with no reality, called for no sacrifice of convenience, not a foot of space, not a pound of material. That *first* House of Commons had no acres of show approaches; it required no such paltry extrinsic substitutes for intrinsic splendour, for it had the reality. It lost no beauty on account of its utility; it lost no utility on account of its beauty. There were no commissions to inquire into its acoustic marvels; for the world was old enough, even then, to build a room in which 600 people could hear each other singly. The builders had learned to retain all the advantages of a rotunda without its defects; to bring a given number as near together as possible, and yet avoid the echoes of curved surfaces. But neither experience nor methodised science had anything to do with settling the form of the new House. One word, *precedent*, silenced all reasons; and the makeshifts used for about two centuries had irrevocably fixed that a House of Commons *must* be rectangular; though the permanent building previously used for *three* centuries (one of many built expressly for debating-rooms) had fixed nothing. If it had but occurred to some one to meet precedent with precedent, and observe that there was both *older* and *longer* precedent for the debating-room than the chapel —for the octagon than the rectangle; perhaps that would have obtained what scientific reasons could not*.

A wondrous pile, after all, is this Palace of Westminster; but more wondrous lie within a stone's-throw, and scattered over the land. Greater far was the silent triumph of those who could erect piles as magnificent as this, and yet as pretenceless as the cottage of the rustic, who builds what the Queen, Lords, and Commons of England cannot afford—a house without counterfeits.

Strangers are admitted to a gallery of the House of Commons, during its debates, by an order from any member. The front portion of the same gallery, or else a better one, is distinguished as the Speaker's Gallery, and each member can also put one name on the daily list for admission to this gallery; but as it only has room for about 20, only those first on the spot can generally be admitted. It is intended also to appropriate one gallery in the new House to ladies, who have not been admitted since 1738. A change of opinion since the completion of the House, as to the proper space allowable between the members' seats (which has been increased 5 in.) has obliged the greater part of the largest gallery at the bar end to be appropriated to members, which leaves much less room for the public than was designed.

The upper story of the river front is occupied almost entirely by committee-rooms; as is the central third part of the lower story; the rest by the libraries for members of both Houses; and the end projections by residences: that at the north for the Speaker, and that at the south for the Usher of the Black Rod. The south return contains the apartments of the Lords' Librarian, and the north those of the Sergeant-at-Arms. The tower at the northern extremity of all is to have a standard clock, with four dials, each 30 ft. in diameter, constructed under the direction of the Astronomer Royal. (*This* will be no counterfeit—*this* will be like the buildings of the Benedictines.) The steeple above is intended to resemble very nearly that of the Town House of Brussels, but on a smaller scale, reaching only the height of 320 ft.; that over the central octagon being meant to be 300, and the four corner pinnacles of the Great or Victoria Tower, 340 †.

If, in this brief account, we have not indulged in the self-gratulation usual in English descriptions of this edifice, it is because we cannot forget that this is no erection of a day, or of a man, or of a class. The ability, the art, the science of modern England, are represented by it—by it must be estimated—by it, in the eyes of the world and of all posterity, must stand or fall. No explanation can be heard, no excuse admitted. The world judges all eventually by their works alone; and for men, for societies and fraternities even, hears extenuations and makes allowances, but not for nations. What Karnac is to Egypt, what the Parthenon is to Greece, the Colisseum to old Rome, or St. Peter's to her daughter, such, at least, this building stands to modern England—nay, it stands for more. They (except the last) were not openly, deliberately undertaken, and meant as their age's *best*. This *is*: as such it has been proclaimed with sound of trumpet over and over again; as such the world has a right to regard it; and as nothing else can it be regarded. Rightly or wrongly, truly or falsely, and whether we like it or no, as long as our girders uphold their loads—as long as they are not all rust—and long after our joiners' disguises are all touchwood—long after our finery has perished, and left bare all the rude deformity behind—long after the garb assumed to mimic Gothic refinement has served its turn, and left bare the realities of our construction in all their Celtic barbarism; this pile must stand the type of England's nineteenth century taste (and taste is character)—the best of her art—the best of her science—the material embodiment of her civilization, and (as compared with former works) of her *progress*. It stands our monument and our mirror, to reflect our image to others, whether we choose to see it or not. Perhaps, like our famous countrywoman, we shall call it a distorting glass that shows us how old and ugly we are grown, and how much paint we require. The world will not believe this.

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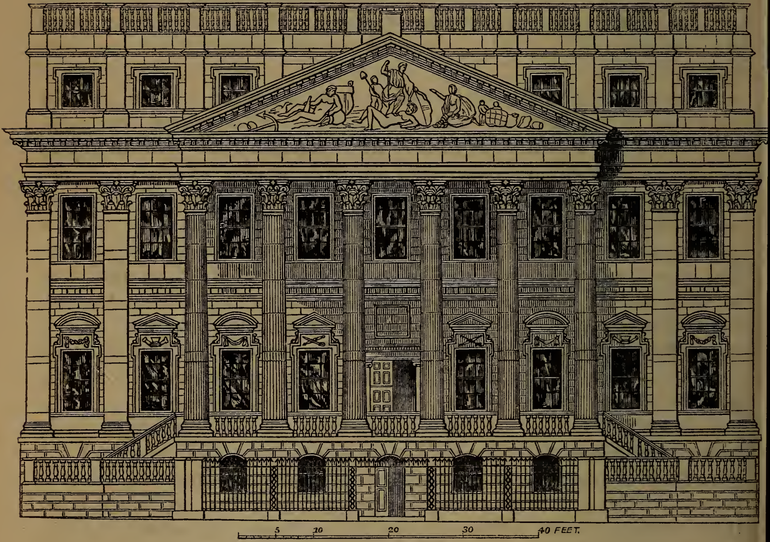
* Something like a reason, indeed, was pretended, against more compact forms than the present, on account of the classification of members; but most common-sense people would think this a matter regarding the arrangement of seats, not of walls and ceilings.

† St. Paul's cross, 365; Salisbury, 400.

The visitor to this pile will, of course, not neglect either of its three beauteous relics of other times (see pages 151, 155, 165, 177): the chapel crypt, descended from the glorious days of Edward I.; the hall that the last of a long dynasty built to be the scene of his own fall; and the cloisters of Henry VIII., adjoining both. The first and last, indeed, are small works, and almost buried, but no less than their grand neighbour are they historically and artistically precious; and this not as recording the quaint fashions of distant periods. No, their differences lie far deeper than fits of fashion; they mark each an epoch in the progress of our taste. A happy (and we cannot but think singular) coincidence has preserved in this spot three eminently typical specimens of English art; one fragment (the crypt) from about the end of its age of sterling gold, when it had attained the climax of pretenceless excellence; another monument (the hall), the first decided manifestation on a great scale of the germ (as we firmly believe) of that principle of *representation* which has overgrown and destroyed our arts—has mainly effected all their changes from the golden age to that of iron, nay, further, to that of tinsel; and a third (the cloister), the very last unmixed production of indigenous English art. It is to be regretted that one walk of this cloister, being meant to form a short passage to the House of Commons (for the use of members only) is to be (or possibly has been) rebuilt on a new design. The same spirit that swept off St. Stephen's, lest a reality should "not harmonize with" counterfeits, will doubtless yet do all the work that remains for it. We should think that what is worth such vast and costly imitation, must itself be worth preserving. Surely there must be something true in what a whole generation deigns to mimic; something great in what even this great age cannot do, yet thinks worth counterfeiting.

Representative art is the chief homage extorted by true art; as hypocrisy is the indirect tribute to virtue. Such tribute the masters of the old world were forced, quite against their will, to pay to a little conquered province; and all their mighty efforts to glorify themselves are found, as time advances and mists clear off, to reflect only additional lustre on Greece the imitated. So it is with us; the nineteenth century may build, but the thirteenth takes all the honour. We may pay, but theirs is the credit. It takes wing, and flies at once to its right owners. All the vulgar material greatness, the miles, the tons, the millions, whom or what do they honour, but that which is worth such repetition? The great things Old England thinks to do to her own glory, become merely foils to set off the far greater that Young England did to the glory of God.

Lambeth Palace, on the Surrey bank of the Thames, a little above Westminster Palace.—In very early times the palace of the Bishops of Rochester, from whom, in the time of Cœur de Lion, it passed to the Archbishops of Canterbury, and has continued their town residence ever since. It contains various fragments of architecture, the first being the walls and crypt of the *chapel* (see p. 140) erected by Archbishop Boniface, about 1244. The screen was erected by Laud; and one of the charges against him was for restoring "idolatrous" glass-paintings in its windows. These were a second time destroyed; and the present paintings are modern, as well as the roof. The stone tower adjoining the west end of this chapel is called the *Lollards' Tower*, and was used for imprisoning those unfortunate sectaries, from its erection by Archbishop Chicheley, in 1434, till the Reformation. Their dungeon is at the top, wainscoted with oak, having on each of its walls two iron rings for chains; and in the oak are cut several names and rude inscriptions, as "Nosce Teipsum," "Ihsu cyppe [keep] me out of all el compane, amen," &c. The next remnant, probably, is the *Guard-room*, having a curious arched and ornamental oak roof, but its history is unknown. The great brick *Gate-house*, with its three towers, was erected by Cardinal Morton, at the end of the fifteenth century. Of the sixteenth, there apparently are no remains. Next is the *Library*, begun by Archbishop Bancroft, who died in 1610. It contains 25,000 volumes, and forms a gallery round the four sides of a small court, formerly the cloister. The *Hall* (see engraving, p. 174) was erected by Archbishop Juxon and his executors, and bears the date 1663. This was the primate who attended Charles I. on the scaffold. Subsequently to this no remarkable buildings have been added. There are many portraits of archbishops, one (of Archbishop Warham) by Holbein.



THE MANSION HOUSE.

Mansion House, at the corner of Walbrook and King William Street; the official residence of the Lord Mayor, the chief magistrate of London, who is renewed annually. The building occupies the site of a market, and was begun in 1739, by the elder Dance. The façade, which is crowded and overloaded without being rich, has allegorical sculpture in the pediment, designed by Sir Robert Taylor; which, like the only other ornament of the kind, that of the East India House, being turned to the north, is not intelligible; yet its contrast with that lately executed upon the Royal Exchange is not flattering to our progress in sculpture between 1745 and 1845. A long narrow attic which originally ran across the centre of the roof, and was called the Mayor's (mare's) nest, has been removed. The Mansion House contains some handsome rooms, of which the principal is called the Egyptian Hall, being an imitation of what Vitruvius describes under that name. The Mayor here gives a splendid private entertainment on Easter Monday, and is always expected to spend during the year, on other festivities and for public purposes, at least the 8000*l.* which he receives as salary, and much more is usually spent.

During his short term of office, and within his narrow realm of the city, this magistrate is so completely paramount as to take precedence even of the Royal Family, as Sir James Shaw successfully maintained against George IV., when Prince of Wales. The Lord Mayor is elected from those aldermen who have not held this office already, but have held that of Sheriff. He is elected on September 29th, but not installed till November 9th, when he goes in a procession, the most ceremonious that has been preserved to us, by the streets to Blackfriars Bridge, and thence by water to Westminster Hall, to take the oaths, and returns with the same state to hold his inauguration banquet, in Guildhall, to which the Ministers of State are always invited. The carriage used in this procession is second only to the Sovereign's state carriage in cumbrous magnificence, and was designed by Cipriani, in 1757. Many other curious pageants are kept up, and an attempt was made in 1850 to revive some of the masques that accompanied this "Lord Mayor's Show" in the fifteenth and sixteenth centuries. The first Lord Mayor of London was Henry Fitz Alwyn, who held office from 1190 to 1214. (See also pp. 329, 330.)

NATIONAL GALLERY, *Trafalgar Square.*—(See also article "Galleries.")—A public collection of paintings, begun by order of Parliament in 1824, by the purchase, for 57,000*l.*, of Mr. Angerstein's collection of 38 pictures of the old masters, to which about 300 more have been added, partly by various grants of Government, and partly by private bequests and gifts; of which the most important have been those of Sir George Beaumont, the Rev. W. Holwell Carr, Lord Farnborough, and the late Mr. Vernon. The whole, except those presented by Mr. Vernon, are kept, for the present, in the west wing of the building occupying the north side of Trafalgar Square (the eastern half being occupied by the Royal Academy), which building was erected, for the joint purpose, in 1832–8, and designed by W. Wilkins, R.A. Mr. Vernon's patriotic gift, consisting of 162 pictures, all recent English productions (chiefly by living artists), is, for the present, at Marlborough House. They were presented in 1847, and for some months the liberal donor gave up part of his own house for their exhibition.

The National Gallery is open from 10 to dusk in winter, or to 6 n summer, on the first four days of the week, to the general public; and on Friday and Saturday to students; but closed to both during the latter half of September and the month of October. Catalogues, at various prices, down to a penny, are sold at the door.

Among the finest pictures are, of the Italian schools, the Raising of Lazarus (*Sebastian del Piombo*, the figure of Lazarus supposed to be by *Michael Angelo*); two parts of an Altar-piece (*Francia*); Cartoon of the Murder of the Innocents (*Raphael*); St. Catherine of Alexandria (*Raphael*); Pope Giulio II. (*Raphael*); the Vision of a Knight (*Raphael*); Christ with the Doctors (*L. da Vinci*); Ecce Homo (*Corregio*); the Virgin, called "au panier" (*Corregio*); Mercury teaching Cupid in the Presence of his Mother (*Corregio*); a Concert (*Titian* or *Giorgione*); Bacchus and Ariadne (*Titian*); the Holy Family (*Titian*); Apollo learning to play the Reed (*A. Caracci*); "Venio iterum crucifigi" (*A. Caracci*); Susannah (*L. Caracci*); the same, by *Guido;* Mary Magdalen (*Guido*); Venus and the Graces (*Guido*). (See again "Galleries," pp. 420, 421.)

PALACES (ROYAL).—London first became the capital and royal city of England soon after the Norman Conquest. It had, indeed, in the time of the Heptarchy, been the capital of Essex, a small state soon absorbed into its neighbours; but on the consolidation of all these by Egbert, Winchester became the seat of the Saxon Monarchy, and so continued till the Conquest; when William, seeing the rising importance of London and the pre-eminence which its river situation could not fail eventually to bring it, at once stamped it as the new and permanent capital, by erecting his palace, the *Tower* (see "Tower"). This, though virtually become little more than a state prison, retained its palatial name and rank till the accession of Elizabeth, who, having been once confined there by her sister, had of course little affection for the place.

The second London palace was that of *Westminster*, begun by William Rufus, under the shadow of Edward the Confessor's stately abbey church, and on what was then the green rural bank of the river, two miles beyond the "west end" of London. Of this palace only a few fragments remain uncovered by the masonry of Westminster Hall, which, however, being of the exact size (built on the foundations) of "Rufus's roaring hall," gives us an idea of the grand scale of Norman taste and hospitality. This continued the chief (or sometimes the only) town residence of English kings for the next 450 years (1097 to 1547). King Stephen founded St. Stephen's collegiate chapel, in 1150; Edward I. rebuilt its crypt, in the beautiful form we now see ("Architecture," p. 158); Edward III. added the gorgeous superstructure, now destroyed; Richard II. built the present magnificent Hall (p. 157); and, lastly, Henry VIII., in the early part of his reign, made the last addition to this famous palace, the small but elaborate cloisters, the last effort of indigenous building art. On the accession of Edward VI. the chapel was first given up to the use of the House of Commons (who had till then met in the Abbey Chapter-house), and from this time the Palace of Westminster may be said to have changed its former destination as a royal residence for that which it has fulfilled for the last three centuries—the double purpose of a seat of legislature and of judicature. The latter had, almost from its first erection, been carried on either in the Hall itself, or in rooms adjoining it. The present law courts, seven in number, contained in the Italian-fronted building attached to the west side of the Hall, were erected from designs of Sir John Soane, and, with their various appendages, are remarkable for their skilful planning, all the space being turned to account. Each has a public entrance both from the Hall and from the street. All the other modern additions and substitutes that covered the site of this palace having disappeared in the fire of 1834, the present vast Gothic pile was commenced (see "Houses of Parliament").

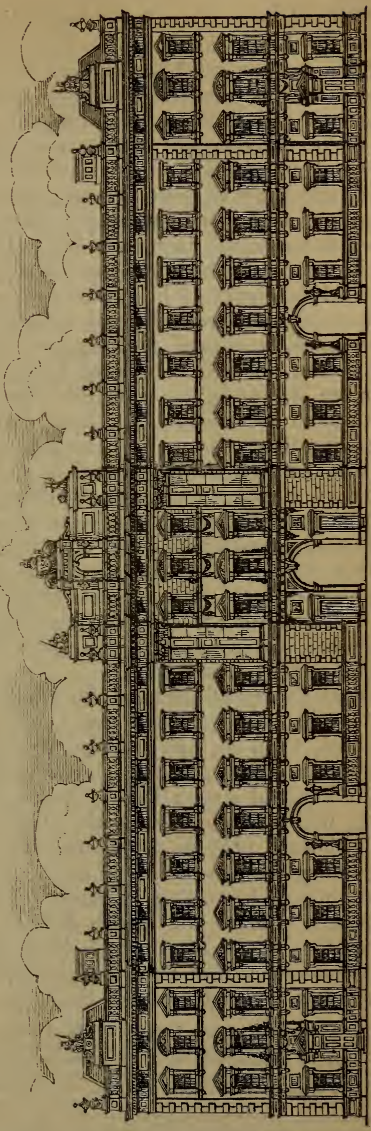
Henry VIII., besides numerous country residences, began the two next London palaces, those of *Whitehall* and *St. James's.*

Whitehall had been a residence of Cardinal Wolsey, and named after him, York House, which, on his disgrace and its delivery to the King, was changed for the present name. The structure, which probably bore much resemblance of style to the contemporary parts of Hampton Court, built by the same haughty churchman, was soon extended so much as to rival its old neighbour at Westminster. It covered not only all the ground between the river and the present street, but also the site of the present Horse Guards, &c., west of the thoroughfare, which then passed through the archways and quadrangles of this palace. St. Martin's parish and church were then first erected, because "his most dradde Magestie" was offended by the numerous funerals passing through, on their way to St. Margaret's churchyard. James I. and his architect, Jones, projected the rebuilding of the whole on a larger scale, in the Italian style; and upon that magnificent plan above alluded to (pp. 176, 177), as at once the most vast and most symmetrical design in secular architecture ever set on foot in any country. Poverty, however, prevented its commencement till after a fire, which (perhaps fortunately) destroyed the old banqueting-house, in 1618. This was replaced by the present apartment, the first piece of purely Italian building in England. Charles I. had the intention of proceeding, when possible, with the superb design, but could do no more than begin decorating this banqueting-room, with the ceiling pictures of his father's apotheosis, painted by Rubens. His tragic end very naturally alienated the affections of his successors from this palace; nevertheless it was the residence of James II. The whole Gothic pile remained till partly destroyed by a fire, in 1691; and a third and still greater, in 1698, which raged seventeen hours, swept off everything but the banqueting-house. The ruins remained untouched many years; in Queen Anne's time the gradual continuation of Jones's vast design was much talked of, but nothing done, and the fragment (turned into a chapel by George I.) still remains isolated. This fine room consists of two side walls, exactly alike, faced outside with Portland stone, and representing a rustic basement 16 feet high; and an Ionic and Corinthian order, together rising to 55 feet more. The basement is occupied by vaults, and all above forms one room, a double cube of 55 feet, with orders of pilasters corresponding to those without, but richer, and a ceiling of nine large panels, containing Rubens' paintings. In the yard behind is a statue of James II., by Grinling Gibbons.

St. James's Palace was originally a hospital for lepers, and made by Henry VIII. a sort of adjunct to Whitehall; the Park (which he inclosed) connecting both. No fragment of his architecture seems to remain externally, except the barbarized gate-tower, nor internally, except a debased Gothic fire-place, with the initials H. A. (Henry and Anna Boleyn). The chapel-royal may perhaps be partly original. Everything else has been patched up in brick, very barbarously as regards the exterior, though the chief apartments are found to answer better than those of Buckingham Palace for holding drawing-rooms, almost the only purpose to which this fabric is now applied. It must be certainly matter of surprise, that it should have served as the only town residence of royalty from the time of William III. to that of William IV., both inclusive, but its extent was much reduced by a fire that destroyed the eastern parts, in 1809.

Kensington Palace, a very plain and irregular building, of red brick, is an enlargement of a house bought from the Earl of Nottingham (son of the Lord Chancellor), in the reign of William III.; and the additions, comprising all the upper story, were designed by Wren. The orangery, however (situated some distance to the north-east), is more noticeable as a specimen of his architecture than the building itself. Considerable additions were made to the back, by George II., who made it his children's nursery, and died here, as did also William and Mary, Queen Anne, and her husband; and her present Majesty was born and held her first council here. The last occupant was the late Duke of Sussex.

Buckingham Palace, now *the* Palace, was also a private mansion, originally called Arlington House, bought and rebuilt in 1703, by the Duke of Buckingham (patron of Dryden); and, after various changes, bought by George III., in 1761, as a "Queen's House," in lieu of old Somerset House, then granted for public offices. All his children were born here, and no remarkable alteration was made till 1825, when George IV., with the advice of John Nash (the builder of Regent Street and the Regent's Park), began its conversion into a palace. There seems to have been no settled design, but (as usual with us at present) the work of planning and constructing (or rather, the *three* works of settling what was to be done, how to do it, and doing it) were carried on simultaneously, (the King even condescending, it is said, to juggle Parliament out of the means, which could not have been obtained by straightforward asking,) and the final result was the entire disappearance of the old house, which fronted the south, and completion of the south, west, and north sides of the present quadrangular palace, together with the low wings running north and south. The whole of this is such a complex medley of the costly and the shabby, in various styles and various materials, as to defy description. Suffice it to say, that it was no sooner finished than (like all English attempts at architecture in the present age) it was pronounced a failure; for, great as our fathers have been in this art almost ever since the dark ages, the present century has half elapsed without producing any *proof* that we can erect things capable of standing twenty years without becoming laughing-stocks.



BUCKINGHAM PALACE.

This palace was not inhabited till the accession of her present Majesty, for whom it was altered by Mr. Blore; but as the inconveniences and insufficiency of George IV.'s structure became continually more crying, in 1846 it was resolved to erect the east side, now just finished, for which 150,000*l.* were voted, or not quite twice the expense of George IV.'s *gateway*, a mere ornament, which is now being re-erected at the north-east entrance of Hyde Park. The style of the new front is German, of the last century, and the architect, Mr. Blore, has wisely abandoned all attempt to make it harmonize with what (being at discord in itself) could harmonize with nothing.

The palace may be viewed, when the Queen is away, by an order from the Lord Chamberlain. The exterior and quadrangle, being (all but the new side) Nash's work, will be best passed by unnoticed. The variety is great, but the only qualities common to the whole, tameness and littleness, unfortunately more marked than in any of the private erections of the same builder, of whom it may be said, (by a slight variation on Augustus' boast) that he found London of brick and left it of tinsel. Here, however, everything was adverse; situation, aspect, method of procedure—all as unlucky as possible, even down to the materials, dingy Bath stone with sculptures of white marble. The interior contains no large rooms, and there is a general deficiency of height, though, perhaps, not more than usual at present, we having become especially niggardly in this respect*. Perhaps it is natural for islanders to carry naval ideas into all structures, and live "between decks." The chief rooms are—the Throne Room, having a marble frieze, "the Wars of the Roses," sculptured by Baily, R.A., from designs by Stothard; the Green Drawing-Room, over the entrance to Nash's building from the quadrangle; the Sculpture Gallery and Library, both on the ground floor. For balls, a tent originally belonging to Tippoo Saib, is erected in the loggia adjoining the Green Drawing-Room. The Ionic conservatory, standing detached, on the south side, has been converted into a chapel. The Queen's private apartments occupy the upper part of the north side, and new front.

The pictures are chiefly of the Dutch and Flemish Schools, and collected by George IV., and are all of great merit. (See article "Galleries," pp. 426-430.)

Post Office (General), *St. Martin's le Grand* (covering the site of a collegiate church of that name). The present building was erected, 1825-9, from a design by Sir Robert Smirke, R.A. It is isolated, and covers a large compact rectangle, and is faced on all sides with Portland stone; but on the west side, which is about 400 feet long, with a façade of very plain Grecian character, to which are attached three porticos, the centre one forming the entrance to a hall extending through the whole depth and height of the building, to its rear, where is another entrance. The Ionic order throughout is similar to that of the British Museum, the column being enlarged from that of the little temple (now destroyed) on the Ilyssus, and the entablature that from Teos, stripped of all carving. The chief rooms are situated north of the hall, where the newspapers, inland letters, and foreign letters, are received at three different windows. On its south side are offices for the local London post. The two halves of the building communicate by a tunnel under the floor of the hall. The middle story of the north half is occupied by the offices for dead, mis-sent, and returned letters, &c.; that of the southern, by secretaries' offices, board-rooms, &c.; and the whole upper story by clerks' sleeping-rooms. (See also "Introduction," pp. 99–102.)

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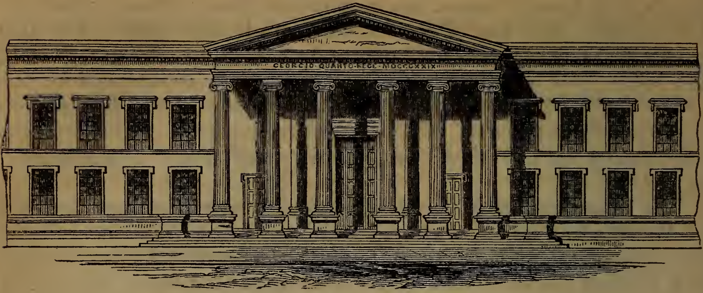
* It is curious to observe how the height allowed to apartments (if not a general measure of the liberality of the age in all respects), seems almost to have risen and fallen exactly with the state of architectural art. Thus, the internal height of churches (taking their clear breadth as the unit), has regularly diminished at the rate of ½ per century, from the thirteenth century, when it was 3, or even 3½ times, down to the present, in which it has been reduced to ½ the breadth. The same remark applies, within narrower limits, to state rooms, which, in the Gothic times, were considerably higher than broad (Guildhall and Crosby Hall for instance). Jones made the height equal the width, and now it is always considerably less. Great height may have partly originated as a substitute for ventilation, and its disuse (though attributable only to pure parsimony), *may* eventually lead to some attention by builders to this requisite, though it has not yet done so.

The postal system of England originated no earlier than the time of Charles I. The old "penny post" for London and its suburbs only, was established in 1680, by the enterprise of Robert Murray and William Dockwra, who immediately quarrelled about the priority of the invention, and it was, in a short time, seized by the Duke of York (afterwards James II.), on whom the monopoly of all letter-carrying had been settled. For many years after this there was only one receiving-house in London for general letters, and only six for London or penny-post letters. There are now nearly 500, all of which receive, indiscriminately, letters for every part of the world. Mail coaches were invented in 1784, by Mr. Palmer; and long before the rise of railways (which have nearly superseded them) had been improved, together with the roads on which they ran, to a degree of expedition and certainty quite unparalleled in animal conveyance. In 1801, the "penny post" was altered into a "twopenny" one; and till 1840, the charges on all letters beyond its limit varied according to distance, the shortest being fourpence. Weight made no difference provided the whole was on one sheet of paper, but any separate piece rendered the letter double. Prepayment was not required and therefore uncommon, and Members of Parliament had the privilege of sending ten letters daily, free. In 1840, by the exertions of Mr. Rowland Hill, the whole was remodelled in its present form, founded on the system of prepayment by stamps, equal charges for every distance, and varying only according to weight. The postage now for all inland letters under half-an-ounce, is one penny; but for all heavier, twopence on every ounce and fraction of an ounce. The great reduction thus made on ordinary letters did not much increase their number at first, but it has now reached nearly five times that under the old system; and this source of revenue, though not so productive as it then was, pays nearly double its expenses, which exceed 1,000,000*l.* per annum.

To and from every place in the country there is at least one post daily, delivered in London between 9 and 11, A.M., and dispatched from London at 8, P.M. Letters for this post are received at the General Office up to 6, P.M., or up to 7 by the extra payment of a penny, and to half-past 7 by that of sixpence. At the branch office in *Lombard Street*, the same rules apply, except the last. At three other offices, viz., *Charing Cross*, *Old Cavendish Street* (Oxford Street), and *Stone's End*, Borough of Southwark, they are received



THE GENERAL POST OFFICE.

till 6, P.M., and with the extra penny till a quarter before 7; at the receiving houses throughout the town, till half-past 5; and by letter-carriers with bells, up to the same hour, by paying them a penny per letter.

Besides this, most places have a second post to and from them, and those within 12 miles of London as many as five daily.

The posts from one part of London to another, within 3 miles of the principal office, are ten daily, which are received at the receiving-houses till 8, A.M., 10, A.M., noon, 1, 2, 3, 4, 5, 6, and 8, P.M., respectively; at the principal office three-quarters of an hour later; and are dispatched for delivery, at 10 A.M., noon, 1, 2, 3, 4, 5, 6, 8, P.M., and 8 next morning.

The receiving-houses are conveniently distinguished by a plate attached to the nearest lamp-post. About fifty of them in London, and one in every country town, issue and pay *money orders*, by means of which 8,000,000*l.* annually is transmitted through the Post Office. The price of this great convenience is *threepence* for sums up to 2*l.*, and *sixpence* for those above 2*l.* up to 5*l.*, which is the largest sum to be sent by one order. Letters containing money, or other valuables, can be *registered* at any office, till within half-an-hour of its closing for common letters; the fee is *sixpence* to any part of Great Britain or France (where such letters become "*lettres chargées*"), and in the latter case, the double French postage.

Unclaimed letters, or those whose owners cannot be found, have their directions copied and exposed in the principal office of the town to which they are sent. In London (where these lists hang at the west end of the hall of the general office), any one writing his address in pencil opposite his name, will receive the letter by the next morning's delivery. Such letters, together with the arrivals and departures of packets, and other information, are also published in the "Daily Packet List."

Parcels weighing above four ounces *must* be prepaid. Those under four ounces, if sent unpaid, are charged double to the receiver; or, if insufficiently paid, the receiver is charged double the deficiency. Over-charges are returned within two days, if the letter be left for that purpose in the hands of the letter-carrier, or presented at a window in the hall of the general office between 10 and 4.

Certain documents go at cheaper rates if sent in covers open at the ends, so as to be examined, viz.:—

All addresses to her Majesty, and petitions to Parliament, sent for presentation to a member of either House (if not exceeding two pounds weight) *free.*

Parliamentary papers (which have their weight printed on them), one penny per *four ounces*, or fraction of four ounces.

Printed books, each singly in its own cover, with no writing but the direction, *sixpence per pound*, or fraction of a pound.

Stamped newspapers, to and from any part of the British Empire, or Colonies, sent within a week of their publication, and with no writing or marks except the direction, *free;* with writing on the paper, *one penny stamp* on the cover.

The same to foreign countries where they are free, and to France, *free;* where they are not free (except France), *twopence* British postage; from France and Belgium to England, *one halfpenny.*

The duties of the London Post Office are suspended on Sundays, Christmas Day, and Good Friday, except as regards passing letters through London from one part of the country to another.

PRISONS (DEBTORS'). The *Queen's Prison*, between the Borough Road and Southwark Bridge Road, Surrey, formerly called the Queen's Bench, but now a consolidation, under a late act, of that and two others, the Fleet and Marshalsea Prisons. It is for debtors and persons charged with or sentenced for contempt of the Court of Queen's Bench. Prisoners were formerly allowed to live anywhere within certain limits called "the rules," but this, which originated in some time of over-crowding and plague, has been abolished since 1835. *Giltspur Street Compter*, a stone-fronted structure, by Dance, 1791, opposite St. Sepulchre's, Newgate. It serves for the jurisdiction of the Sheriffs of London and Middlesex, and contains prisoners for misdemeanor as well as debt. *Whitecross Street Prison*, Cripplegate, built 1813, for debtors only, and belonging to the same Sheriffs.

PRISONS (CRIMINAL) have frightfully increased for many years, and continue to do so with an advancing rate of increase. The chief are:—*Newgate*, at the corner of Newgate Street and Old Bailey; now only a gaol of detention for persons about to be tried at the adjacent Central Criminal Court, but formerly sufficing both for that purpose and for all undergoing sentence for offences in London and Middlesex; though it was, from the time of King John to that of Charles II., merely a tower or moderate appendage to the city gate. Thus, for four centuries and a half, during which London at least decupled its population, we seem to have required no increase of prison room. Even on rebuilding the gate, after the fire, it was not thought necessary to enlarge or remove this adjunct; but from that time it began to be crowded, and the nuisance of an inadequate and totally unventilated prison increased till, in 1750, the gaol fever, communicated by prisoners on trial, killed in one session two judges, several jurors, the Lord Mayor, and others to the number of sixty. Still the present building was not commenced till 1770, nor completed till 1783, the old one having meanwhile been burnt down in the Gordon riots. The architect was George Dance, city surveyor, the same who built the Mansion House and disfigured Guildhall; and the façades, which are 297 feet and 115 feet long, may be considered his best works, and the beau ideal of prison architecture.

The exterior of Newgate is treated just as we may suppose a prison in ancient Rome to have been; and there, this would have been the *true* treatment, for it would have distinguished the building not only by uncommon mass and gloominess, but also by uncommon *plainness*, *rudeness*, and *want of finish*. So also the prison exteriors of the middle ages (the south entrance to the Tower for instance) were easily conformed to true taste, and made prison-like relatively to surrounding structures, because the latter had some beauty, some polish or refinement, which, in the prison, could be dispensed with or reduced. But what is to be done where the general architecture has nothing to dispense with or reduce? What can be done right in prison-building, where *all* building (that is, not a sham) has survived its age of beauty long ago, survived the last vestiges of comeliness, and (repudiating all beyond material and animal requirements) has reached the *ne plus ultra* of animal sameness and second savagehood? Nothing can be *distinguished* by prison-like qualities, where rudeness and squalor have in *everything* reached their climax; where niggardliness of finish and niggardliness of thought have advanced till they can be pushed no farther; where society is too poor to afford anything at once ornamental and *real;* because the arts that once served to glorify God by imitating the excellences of nature, and to profit man and ennoble his works by making them vehicles of thought and truth, are employed solely in counterfeiting appearances of wealth, or appearances casually associated with wealth, to assist the imagination of every class in fancying themselves a little richer than they are; because millions are worked and fed to supply make-believes; because society devotes to this end, and to sham excitements, *all* the wealth, *all* the labour not required for the supply of animal necessities; and *more than all*, so that the suppliers of *them* are pauperized.

It may be said, indeed, that a prison should be designed as cheaply as possible—not only without *ornament*, but without the *deceits* and *pretences* elsewhere required to keep up appearances of what is called respectability; that it might have neither a stone nor a tool-stroke not conducive to its material requirements, to convenience or to durability—not a feature to satisfy a fashion or a fiction, either of architecture or of bricklayership. But this would greatly increase the trouble of design; and yet, after all, be inconsistent, because it would make prisons in fact the most beautiful, the most truthful, of our buildings; the only ornaments to redeem the landscape that our other erections had blotted and deformed. This would too grossly disagree with their destination. It would never do for it to be said, "we dwell in sham houses, pray in sham churches, learn in sham colleges, administer the law in sham tribunals, but send its transgressors to a *real* prison." Such would be the effect of a return towards architectural truth beginning in this lowest class of building; and yet it is more likely to begin in this than in any other, because it would here be most profitable to the pocket.

From whatever point viewed, therefore, the architecture of prisons presents (like everything relating to them) insuperable dilemmas; because all perplexities of the system run down and collect here as in a sink, and, whencesoever arising, it is here alone that they show themselves undisguised.

Bridewell was originally a royal palace named after a *well* in the parish of *St. Bride's*, and was given by Edward VI. as the first Workhouse, or rather House of Correction, "for the strumpet and idle person, for the rioter that consumeth all, and for the vagabond that will abide in no place." Long regarded as an hospital rather than a prison, this asylum only drew an increase of vagabonds to the capital. The present building serves for 100, in single cells, undergoing sentences not exceeding three months. Bridewell has become a general name for prisons of a similar character throughout the country.

The following is a general summary of the prisons connected with the metropolis, including some of those previously mentioned;—

Pentonville Prison.—That great question of crime and punishment, which in its national import, creates so deep an anxiety, and claims so large a provision of corrective if not remedial measures, has been greatly elucidated within the last few years by the experience obtained in the Pentonville Prison, which was designed to be a model of construction, and to be appropriated for carrying into effect the "separate system" of discipline. Before describing that building, however, a brief narrative, derived from official documents, of the leading circumstances connected with prison improvements in this country, may be appropriately presented, and will assist in explaining the particular form of prison conduct which the Pentonville establishment is intended to enforce.

The earliest recorded steps taken for the improvement of prison discipline appear to have been provoked by the exposure made by the distinguished philanthropist, Howard, who, being taken prisoner by a French privateer, in a voyage to Lisbon, in 1755, suffered the barbarous treatment then inflicted on the unfortunate occupants of the Castle of Brest, and determined to devote his future life to an attempt to mitigate the sufferings to which all prisoners were then as a matter of course in all cases subjected. Howard was, in 1773, created high sheriff of the county of Bedford, and while filling this office he had many opportunities of observing the state of the jails under his jurisdiction. Having given his immediate attention to the alleviation of individual distresses, and the remedy of such general grievances as he could succeed in controlling, this benevolent man resolved to pursue his investigation over the country, and accordingly proceeded upon tours into the counties of Hertford, Berks, Wilts, Dorset, Hants, Sussex, Surrey, &c. He was subsequently examined before a Committee of the House of Commons, as to the results of his inquiries, and received the thanks of the House for his benevolent exertions.

In the year 1773 to 1784, Mr. Howard extended his inspection to the prisons and bridewells of England, Scotland, Ireland, France, Holland, Germany, Switzerland, Denmark, Sweden, Russia, Poland, Spain, and Portugal, and published an account of his observations in a valuable work on the state of prisons, with an appendix. This distinguished ornament of our country and of the human race, met his lamented death on the 20th January, 1790, at Cherson, in Russian Tartary, having received an infectious fever, a species of plague, by his humane visits to the hospitals of that place.

The exertions of John Howard, and the political events by which their objects were promoted, are thus referred to by the Inspectors of Prisons of Great Britain for the Home District, in their Third Reports:—

"Together with the remonstrances of this distinguished benefactor of mankind, circumstances powerfully co-operated to produce a general desire for the improvement of our prisons, and imposed on us the necessity of immediately devising an enlarged system of transportation. The result of this combination of humane remonstrance and political necessity, appears to have been a general desire that something should be speedily done to improve our prison discipline. The first impulse to public feeling was given by the labours of Howard; and great is the obligation which the cause of humanity owes to the unwearied industry and ardent benevolence of this distinguished philanthropist. His labours were rewarded by that deep and national feeling of commiseration for the sufferings of prisoners which followed that faithful exposure of them, which his earnest wishes for their mitigation, and his truly Christian courage, prompted him to make. But the attention of this excellent man seems to have been almost absorbed by the physical sufferings which it was his lot to witness. The very magnitude and intensity of those sufferings seem to have prevented him from looking beyond them to a consideration of the moral evils of imprisonment, which are even still more deplorable than the prisoners' privations and discomforts, and without the proper remedy for which, even an improvement of his physical condition is but too often a greater incentive to his further advancement in crime and vice. The impulse, however, was thus given to the desire and demand for prison improvements; it was prompt and decisive, and to Howard the praise is most justly due."

The notion which has been *officially* formed and acted upon, as to the way in which this "proper remedy" for "the moral evils of imprisonment" is to be sought within prisons, was described by the then Secretary of State for the Home Department (Sir J. Graham), in a letter dated 16th December, 1842, addressed to the Commissioners for the government of Pentonville Prison. From this description, the following extract is quoted here, as it so well explains the object aimed at in the conduct of the establishments now under our notice. On this account, also, the length of the extract must be excused.

"It is useless to discuss the abstract question, whether under any regulation a prison can supply the means of reforming the character of hardened offenders. It is enough to observe that the limited number which the Model Prison can contain, will, in the hope of reformation, be generally confined to those who are convicted of their first offence, and whose age is between 18 and 35.

"Considering the excessive supply of labour in this country, its consequent depreciation, and the fastidious rejection of all those whose character is tainted, I wish to admit no prisoner into Pentonville who is not sentenced to transportation, and who is not doomed to be transported !

"The convict, on whom the discipline might have produced the most salutary effect, when liberated and thrown back on society here, would still be branded as a criminal, and would have an indifferent chance of a livelihood from the profitable exercise of honest industry. His degradation and his wants would soon obliterate the good impressions he might have received, and by the force of circumstances which he could not control, he would be drawn again into his former habits; he would rejoin his old companions, and renew the career of crime.

"Not so the convict transported from Pentonville. The chain of former habits would be broken; his early associations would be altered; a new scene would open to his view, where skilled labour is in great demand, where the earnings of industry rapidly accumulate, where independence may be gained, and where the stain of tarnished character is not quite indelible.

"This is the favourable position for ripening the fruit of improved prison discipline; this is the best chance for turning to account the instruction given in useful manual labour; this is the prospect which will revive hope in the bosom of the prisoner, which will confirm his good resolutions, and which will stimulate him to energy and to virtue.

"I propose, therefore, that no prisoner shall be admitted into Pentonville without the knowledge that it is the portal to the penal colony, and without the certainty that he bids adieu to his connexions in England, and that he must look forward to a life of labour in another hemisphere.

"But from the day of his entrance into the prison, while I extinguish the hope of return to his family and friends, I would open to him fully and distinctly the fate which awaits him, and the degree of influence which his own conduct will infallibly have over his future fortunes.

"He should be made to feel that from that day he enters on a new career. The classification of the convicts in the colony, as set forth in Lord Stanley's despatches, should be made intelligible to him. He should be told that his imprisonment is a period of probation; that it will not be prolonged above 18 months; that an opportunity of learning those arts which will enable him to earn his bread, will be afforded, under the best instructors; that moral and religious knowledge will be imparted to him as a guide for his future life; that at the end of 18 months, when a just estimate can be formed of the effect produced by the discipline on his character, he will be sent to Van Dieman's Land, there, if he behave well, at once to receive a ticket of leave, which is equivalent to freedom, with the certainty of abundant maintenance, the fruit of industry; if he behave indifferently, he will be transported to Van Dieman's Land, there to receive a probationary pass, which will secure to him only to him a limited portion of his own earnings, and which will impose certain galling restraints on his personal liberty; if he behave ill, and if the discipline of the prison be ineffectual, he will be transported to Tasman's Peninsula, there to work in a probationary gang, without wages, deprived of liberty—an abject convict."

The general arrangement of the Pentonville Prison building comprehends a central hall open from floor to roof with spacious corridors of a similar construction radiating from it, having ranges of cells placed on each side. The wings or divisions containing the cells, being thus connected with the central building, the whole interior of the prison and the door of every cell are seen from one point. The stairs of communication being also placed in the corridors, and made of open iron framing, do not impede a clear view being obtained from the hall to the extremity of each wing, or from one end of a corridor to the other; and every movement within the prison, whether of an officer or a prisoner, is therefore under constant observation and control.

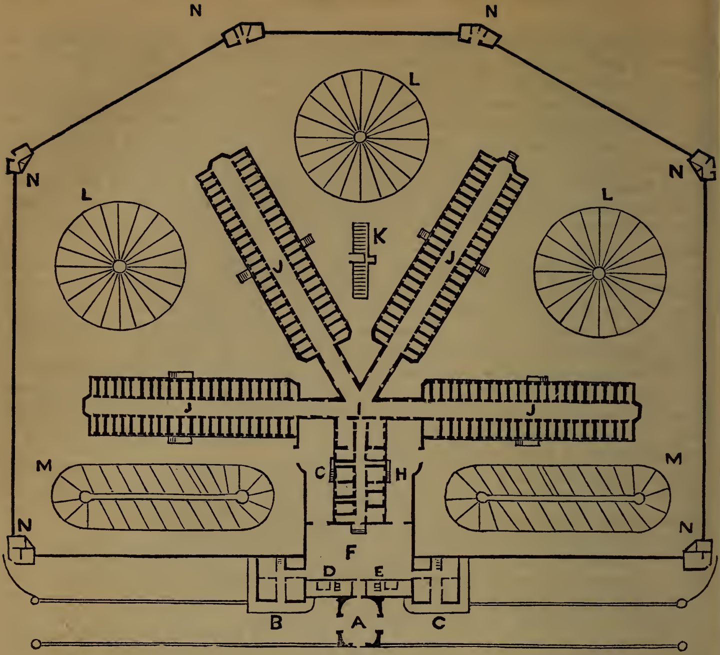


Fig. 1.

Of this principle of construction an example exists at Rome, and is thus described by Monsieur Duchatel, Minister of the Interior of France in 1842, in his work entitled "Instruction et Programme pour la Construction des Maisons d'Arret et de Justice."

References to Figures.

Fig. 1 represents a ground plan of the prison.
A, Entrance gateway.
B, Chaplain's residence.
C, Governor's residence.
D, Rooms appropriated to the use of the messenger and inner porter.
E, Rooms appropriated to the use of the reception warder and outer porter.
F, Entrance court, 34 ft. by 46 ft. in dimensions.
G, Waiting room and offices for the commissioners, secretary, chaplain, and physician.
H, Corresponding range of offices for governor, clerk, and deputy governor, and visiting rooms.
I, Central hall.
J, J, J, J, The four wings of the prison, or ranges of cells.
K, House for pumping machinery, and cells for prisoners engaged in working it.
L, L, L, Three sets of radial exercising yards.
M, M, Two front sets of exercising yards.
N, N, N, N, N, N, Apartments at angles of external wall, occupied by warders.

Fig. 2 shows a longitudinal elevation of one of the wings of the prison, and fig. 3 an internal and transverse section of part of one of them, the same letters referring to the same parts in both of these figures.

A, B, C, Inlets for introduction of fresh air.
D, E, F, Outlets for discharge of fresh air.
G, G, Main fresh air flues.
H, H, Warming apparatus.
I, J, Cold air flues.
K, Main foul air flue.
L, Smoke flue from apparatus, shown by a dotted line.
M, Fire-place for summer ventilation.
N, N, N, N, Galleries supported on iron brackets

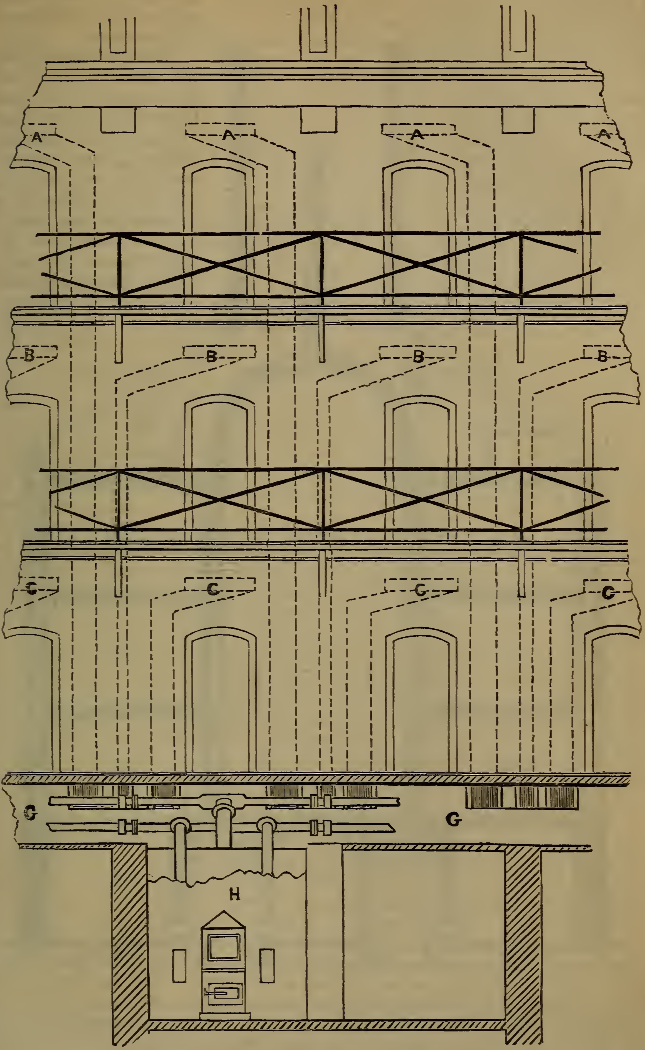


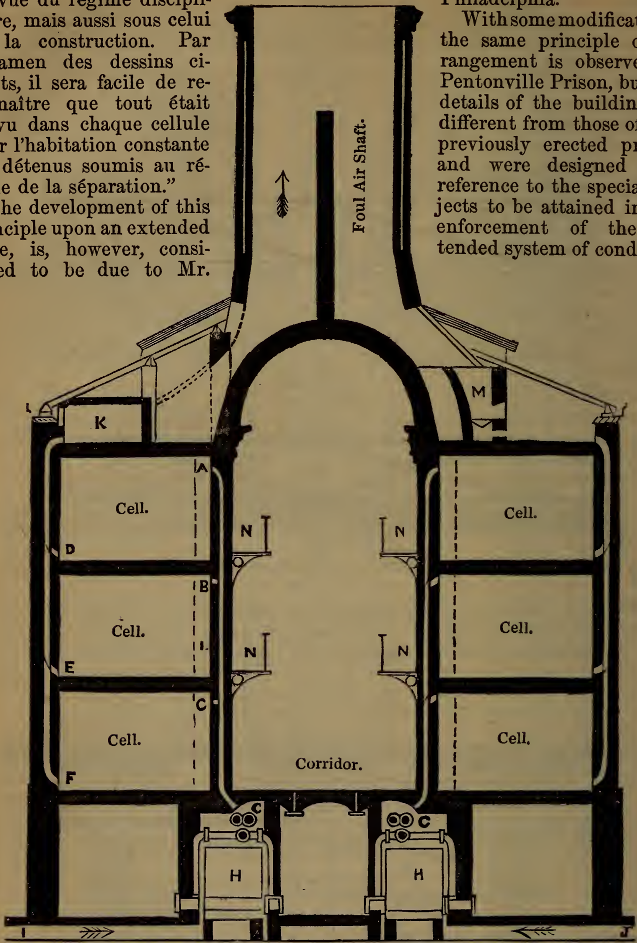
FIG. 2.

"'Cette prison fut élevée par les ordres du Pape Clément XI. de 1703 à 1735. Si l'on entre dans l'examen detaillé du systeme, et même de la disposition architecturale de cette prison, on reconnaître que les Américains ne sont que les imitateurs des Italiens, non seulement sous le point de vue du régime disciplinaire, mais aussi sous celui de la construction. Par l'examen des dessins ci-joints, il sera facile de reconnaître que tout était prévu dans chaque cellule pour l'habitation constante des détenus soumis au régime de la séparation."

The development of this principle upon an extended scale, is, however, considered to be due to Mr. Haviland, who designe and erected the Eastern a Philadelphia.

With some modification the same principle of arrangement is observed i Pentonville Prison, but th details of the building ar different from those of an previously erected prison, and were designed with reference to the special objects to be attained in the enforcement of the intended system of conduct.

Fig. 3.



The accompanying three figures will serve to shew the arrangement and construction of the Pentonville Prison, which occupies a rising site on the right hand of the road leading from King's Cross to Holloway, and designated "The Thornhill Bridge Road." Of these figures, the first (Fig. 1), shows a ground plan of the entire prison with the exercising yards, boundary wall, and warders' houses at the angles of the wall. (Fig. 3), shows a transverse section of one of the wings, with the three ranges of cells, the air flues for ventilation, and for warming, the middle corridor and galleries supported upon iron brackets, &c. (Fig. 2), represents an interior longitudinal elevation of a portion of one of the wings, and shews the doors of the cells, the galleries, &c.

The first stone of the building was laid on the 10th April, 1840, and the works were completed in the autumn of 1842. The prison was intended for the reception of male convicts between the ages of 18 and 35, and to be conducted upon the "separate system of discipline," which, it should be remarked, originated in England, and was the subject of legislative enactment so long ago as the year 1778. The Pentonville Prison was first occupied on the 21st December, 1842. Among the provisions of the 2nd and 3rd Vic. c. 56, it was stipulated that "no cell shall be used for the separate confinement of prisoners which is not of such a size, and lighted, warmed, and ventilated in such a manner as may be required by a due regard to health, and furnished with the means of enabling a prisoner to communicate at any time, with an officer of the prison." Also, that a prisoner should have the means of taking air and exercise when required; that he should be furnished with the means of moral and religious instruction, with books, and also with labour or employment. The standard size of cell adopted in this prison is 13 ft. in length, by 7 ft. in breadth, and 9 ft. in height. To avoid all communication between the prisoners, it was determined to fit up each cell with the means of washing, and with other conveniences, so as to render it unnecessary for any prisoner to quit his cell except to attend chapel, and take exercise. The building is constructed mainly of brickwork, with iron sashes, iron bars, doors, &c. The foundations are laid on solid concrete, 3 ft. deep and 3 ft. wide, and over the whole surface of the walls a course of slate is laid in cement six inches above the ground line, thus effectually preventing the access of moisture by capillary attraction.

Basement.—Under the entrance building is a reception ward, in which prisoners are detained until examined by the medical officer, and reported fit for admission. Here also are an examining room, clothing stores, bath, and a closet for fumigating and purifying clothes. The basement beneath the central hall is appropriated to materials, stores, provisions, &c. The cooking department comprises a kitchen, furnished with a steam apparatus and contiguous stores for meat, bread, flour, potatoes, &c. Adjoining the kitchen is a room in which the provisions are weighed out and arranged in trays, which are then placed in a hoisting apparatus, and raised for distribution to the ground floor and upper cells. This distribution is ingeniously and rapidly effected by placing the trays upon light iron carriages, which are fitted to span the middle space in each corridor, and run upon the hand-railing of the galleries. The remainder of the basement is used as a mess-room for the subordinate officers of the establishment; and also comprises cells for punishment, workshops, &c.

Ground Floor, shown on Fig. 1, comprises four wings, each containing cells on each side, and an entrance building comprising several important offices for conducting the affairs of the prison. The following references to the corresponding letters shown on the plan will explain this appropriation in sufficient detail.

The entire area occupied by the prison and grounds, which is inclosed by a boundary wall, measures 6 acres and 10 perches, and there is a terrace and road 75 ft. broad in front of the prison, and spaces respectively of 30 and 20 ft. on the two sides, with a garden of 2 acres in the rear. In the spaces between and in front of the wings, the exercising yards are placed; these are arranged in five sets, three of which are circular, and the other two of an oblong figure. The entrance-gate forms the first or front barrier; the two side gates, and the front door of the prison, form the second barrier; and the third consists of the door opening into the central hall on the ground floor, and two doors on the basement, which lead from the kitchen and stores before described.

The well from which the prison is supplied with water, is situated between two of the wings, and the pumps are worked by a shaft and cranks fixed in bearings, and carried through a series of small compartments, each of which may be occupied by a single prisoner, and thus any amount of manual power may be applied for the purpose without admitting communication between those employed.

Upper floors.—The *Chapel* is situated in the upper part of the entrance-building, and is approached by stairs from the level of the first and second galleries in the central hall. The seats in the chapel are so disposed, that while each prisoner is effectually separated from all his fellows, he can see and be seen by the chaplain, and is also exposed to the inspection and control of the prison officers. As each prisoner enters his stall, he closes the door after him, and so soon as the row of stalls becomes occupied, the officer fastens the whole of the doors in the row simultaneously, by a simple mechanical contrivance. For the purpose of ventilating the chapel, the space beneath the gallery is adopted as an air chamber, and perforations for admitting fresh air are made in the risers under the seats. The vitiated air passes into the roof, and thence through the clock tower, and owing to the altitude and difference of temperature, this means of egress is found effective without further assistance. Under the same roof as the chapel, infirmary or convalescent rooms are provided for cases in which the constant attendance of a nurse is required, or infectious diseases appear, but for all ordinary cases of indisposition, the common cells are found sufficient, being well adapted, by the adequacy of space and thorough ventilation, for medical treatment and superintendence without removing the patient.

Ventilation.—The windows of the cells being fixed, and the doors commonly closed, it is evident that some other than the ordinary means of ventilation are required in order to withdraw the vitiated air, and to supply the necessary quantity of fresh air. Two other conditions are also imposed in order to render the temperature of the cells accordant with the health of their inmates, and to preserve the discipline of the prison : these are, first, that means shall be provided for warming the fresh air, when necessary, without injuring its qualities; and, second, that the flues or channels for the transmission of the air shall not facilitate, to any degree, the transmission of sound. The general arrangement of the heating apparatus and air-flues will be understood from the section through one of the wings of the prison shown in Fig. 3. The apparatus for warming the air is placed in the middle of the basement story of each wing, and consists of a boiler or case, to which pipes adapted for circulating hot water are connected, and which is also in communication with a large flue open to external atmosphere. The fresh air admitted through this flue, after traversing the boiler surface, is directed right and left along a main flue, which extends horizontally under the corridor-floor, and from thence rises through small flues formed in the wall of the corridor, which terminate severally in a grating placed close under the arched ceiling of each cell on the three stories. Thus, the means are provided of introducing a current of air from the exterior into each cell, and of previously warming it to any required degree, or leaving it at its original temperature. Corresponding arrangements are made for extracting the foul air as follows :—A grating is fixed close to the floor of each cell, on the side next the outer wall, and diagonally opposite to the points of entrance of the fresh air. This grating covers a flue in the outer wall, which communicates at the top with a horizontal foul-air flue in the roof, leading to a vertical shaft raised 20 or 25 feet above the ridge. During the summer, a small fire is kept up at the bottom of this shaft, by which the temperature of the column of air within it is raised above that of the external atmosphere, and its specific weight proportionally reduced. The foul air, consequently, rises and passes away, and the partial vacuum thus produced is instantly filled from the foul-air flues of the several cells. The consumption of fuel for this apparatus has been about 1 cwt. per diem for each wing, containing 130 cells; and the daily cost of thus effecting sufficient ventilation in *summer* time is about fifteen-pence, or about one-eighth of a penny per cell. During the winter season, the warming apparatus in the basement is put in action, and the smoke and disposable heat being thrown into the shaft above the upper cells, the adequate amount of ventilation is found to be thus effected, without involving any additional trouble or expense. The temperature preserved throughout the prison, in winter, is from 52° to 60° Fahrenheit; but for modifying this temperature to suit the feeelings of individual prisoners, regulators are fixed in the fresh-air flues of some of the cells, and by these warm air may be admitted from the main flue, or cool air from the corridor, at pleasure.

Cells.—Each cell, as already stated, has an internal area of 13 feet in length, 7 in breadth, and 9 in height, to the soffit or underside of the arched ceiling, and comprises about 820 cubic feet of space. The division walls between the cells are 18 inches thick, and the external walls 22½ inches. The ceilings of the cells are formed of a half-brick and grouted in cement, overlaid with concrete, which is levelled to receive a coating of asphalte forming the floor of the cell above. The cell doors are fitted with moveable flaps, by which the delivery of provisions, &c., is facilitated; and besides these flaps the doors are provided with small openings for inspection by the officers. Each cell is provided with a soilpan and trap, and a copper basin for washing, fitted with waterpipe, &c. The soilpan, &c., are of strong glazed earthenware. The cells are lighted with gas, and each is provided with a handle, by moving which a gong is sounded, and the officer's attention thus excited, while, by the same movement, a numbered label, which commonly remains against the wall outside the cell, is thrown out at right angles, and so remaining, serves to indicate the cell at which the attendance of the officer is desired. In this way every prisoner has the means of summoning an officer in case of emergency. The supply of water to each cell is derived immediately by a water trough of cast iron which passes along the wall above the cell, and immediately under the floor of the gallery. Each of these troughs (which are supplied from cisterns on the roof of the building) contains one cubic foot, or about six gallons.

Central Hall.—The central hall, as already described, is like the radiating corridors, open from the ground-floor level to the roof, and thus admits a perfect inspection of the main interior of the prison, and at the same time affords great facilities by the hoisting machine, described under the head *"Basement,"* and by a spiral iron staircase, for ready access to all the galleries from one central point, and for the prompt raising of provisions and materials from the basement to all the upper wards.

Exercising Yards.—These are arranged to radiate from a single point or line, round or along which a passage of communication is provided. When the prisoners have been locked up, each singly in one yard or radial compartment, an officer who remains in charge of them has the means of instantly detecting any irregularity by means of inspection, either from openings in the internal walls, or through windows provided above the passages.

Baths.—Eight baths are provided, each 5 ft. 6 in. by 2 ft. on the top, and 2 ft. 6 in. deep. By these 32 prisoners are bathed in one hour, and each prisoner has a bath once a fortnight.

Governor's and Chaplain's Houses.—These are situated one on either side of the entrance building, and each contains ample accommodation for its official occupant.

Cost of the Building.—The total cost of the prison to the period of its occupation was 84,168*l.* 12*s.* 2*d.*, which, divided by the number of cells, 520, gives an average of 161*l.* 17*s.* 2¾*d.* per cell. This amount, it should be observed, includes the furniture and fittings of the whole prison, and quarters for twenty prison officers.

Cost of maintaining Prisoners.—Although this item may be regarded as belonging to the *system of prison discipline* adopted, rather than to the *building* itself, yet as the latter has been specially designed and constructed for carrying the former into complete practice, our estimate of the economy an value of the edifice is liable to be modified by this consideration, and we ma therefore quote the reported fact, that in 1848, the cost for the victualling an management of each prisoner in the Pentonville Prison was very nearly 36*l.* The cost of the building and repairs to the close of the year 1847 is also reported at 93,000*l.* The annual interest upon this capital at 5 per cent. bein 4650*l.* represents the sum of 9*l.* as chargeable against each individual occupant of the establishment, supposing society is criminal enough to keep it cells fully supplied. The annual expense of each prisoner is thus 45*l.*! It has been reported by an officer engaged in carrying out "the system" at Pentonville, that "the effects produced here upon the character of prisoners have been encouraging in a high degree." It would be quite foreign to our purpose to examine the evidence, which *can* be had upon this point. But there is certainly no boldness in venturing the remark, that these "encouragin effects" need the most clear and unequivocal testimony before so large an annual expenditure in the enforcement of *any* system of prison discipline can be justified. And although economy of management should not be aimed at as the principal object in our dealings with crime, it must yet be allowed as a subordinate one; and the desirableness of every method of conducting prisons should be fairly measured by reference to its comparative expense.

The Pentonville or "Model" Prison, on which we have already bestowed so much of our limited space, has been selected for this particular description on account of its adoption by the government of this country as a pattern in construction for all provincial prisons under their control. The "separate" system which those buildings are designed to enforce, appears to have been entertained with much more of theoretical favour than it has been found to deserve in practice, and already several departures from the strictness of discipline first contemplated have been forced upon the management.

Of the other *methods* of ruling criminals, which have been conventionally exalted into "systems," the prisons of London and its suburbs present only two which are to be distinguished from the "separate." These are known as the "silent" and and the "city" systems; the former allowing association between prisoners, but prohibiting conversation; the latter allowing both: prohibiting neither.

It would be impossible to enter upon an examination of the merits and defects of any of these methods. The entire subject is evidently one of the highest importance to the well-being of all human society. Yet it cannot be denied that all attempts yet made in dealing practically with prison discipline are new experiments or trials that have been instituted with only partial reference to the philosophy of the subjects, and have, as might be expected, consequently failed in establishing correct principles, or indicating successful rules of proceeding.

The other prisons in and about the metropolis may be briefly described in the following order:—

First of *national* prisons, or those which, like the Pentonville establishment, are under the control of the government, there are the Millbank Prison, a Penitentiary Hulks or ship prison, and the debtors' prisons of the Queen's Bench and Whitecross Street.

Millbank Prison or Penitentiary is situated on the northern bank of the Thames between Westminster and Vauxhall bridges, and near the latter. It is the most extensive penal establishment in England, comprising an inclosed area of 16 acres (of which 7 are covered with buildings and airing grounds), and being usually tenanted by about 1500 criminals. It is occupied as the depôt for those sentenced to transportation and destined for the government gaols of Pentonville, Reading, or Wakefield; for the Hulks or ship prisons at the dockyards of Woolwich and Portsmouth, or to be expatriated direct. The juvenile convicts are sent to the prison at Parkhurst in the Isle of Wight.

The annual amount of the migratory criminal population of Millbank is thus, from 4000 to 5000. This prison was built to accommodate 1200 prisoners in separate cells upon the solitary system; but this discipline has undergone successive modifications, and is now only very partially observed, the prisoners working daily in common, and submitted only to the rule of silence. The site upon which the prison (which cost nearly 500,000*l.*) is built, is low and marshy, and although all practicable improvements have been effected by drainage and ventilation, the building is yet, and must still remain, unhealthy.

The Hulks or Ship Prisons, which are moored adjoining the Dockyards of Woolwich and Portsmouth, were first adopted for this purpose in accordance with the transportation system. The principal hulks now stationed at Woolwich are the "Warrior," an old seventy-four gun ship, which accommodates about 480 convicts employed in the dockyard, and the "Justitia," in which are lodged those who are employed in the arsenal. The "Warrior," which may be considered as the model hulk, has an external appearance of cleanliness and order, but is internally ill adapted, as, indeed, every ship must be, for lodging and regulating prisoners. Communication between the convicts is not interfered with, and produces the natural consequence of mutual contamination. The men eat and sleep in gangs of from 12 to 20, each gang occupying a separate compartment of the deck, and thus there is, of course, neither silence nor separation.

The Queen's Prison or Bench is (as before mentioned in p. 753) a receptacle for debtors, and, on account of those who have been unfortunate enough to become its inmates, must be regarded as a place with many interesting, although necessarily painful associations. The name "Queen's Bench," formerly rightly applied to this prison, is so no longer, as, by a statute of the 5th and 6th Victoria, the Marshalsea and Fleet Prisons were abolished, and their functions transferred to this, under the new name of the Queen's Prison. This establishment is now under the rule of the Secretary of State for the Home Department, and serves as a national prison, receiving persons committed by the Courts of Queen's Bench, Exchequer, Common Pleas, and Equity. Its occupants are divided into two classes, namely, ordinary debtors, and debtors who are remanded for fraud and defiance of creditors; and each of these classes is subdivided into those who maintain themselves, and those who do not maintain themselves. The prison is open to visitors from 9 in the morning to 7 or 9 in the evening, and there is no let or hindrance to admission. The prisoners are simply kept in custody within the walls of the spacious yard, and each has his own room for sitting and sleeping, except when the overflow of the inhabitants compels the putting two prisoners in one room, a practice technically called *chumming*; and, except in the remand department, are free from restraint which cannot be reasonably complained of.

Whitecross Street Prison, like the Queen's, is entirely a debtors' prison. (See also p. 753.) It is situated in Whitecross Street, Cripplegate, and has also another frontage in Redcross Street. It is divided into six separated wards, called, as follows:—The Middlesex ward; the Poultry and Giltspur Street ward; the Ludgate ward; the dietary ward; the remand ward; and the female ward. The entire prison is capable of holding 500 persons. In the Middlesex ward are confined debtors from the county, while those committed from the city are distributed among the other wards. The Poultry and Giltspur Street ward is occupied by city debtors who are not freemen; the Ludgate ward, by city debtors, who are, or rather it should be said, *were free* men. Freedom of the city is not, however, to be confounded with freedom of the jail. The dietary ward is appropriated to those who cannot maintain themselves. The remand ward is more strictly controlled than the others, and receives debtors committed for fraud, contempt of court, &c. Each ward has its day rooms common to all the prisoners within that ward, and such friends as may visit them. The dormitories are each adapted to contain about eighteen persons, and are furnished with so many separate iron bedsteads, with blanket, quilt, &c. The place is generally tolerably cleanly; but the sleeping rooms are sadly deficient in ventilation, and the water-closets in a shameful state of filth and neglect. These matters, it may be hoped, are in course of amendment, or likely to be so ere long.

Four great prisons have now to be noticed as being within our metropolitan range, but they are distinguished from those heretofore referred to, being under the jurisdiction of the magistrates for the county of Middlesex, and are, therefore, *county* instead of *national* prisons: these are the House of Correction, or Coldbath Fields Prison; House of Detention, at Clerkenwell; Tothill Fields Prison, at Westminster; and Newgate.

The House of Correction, situated in Coldbath Fields, between Gray's-inn-Lane and St. John's Street Road, occupies a site, in building and yard, &c., of about nine acres, and is adapted to contain 1250 prisoners, although a greater number is sometimes forced into it. In this prison silence is rigidly imposed; but the prisoners work in common, and are kept in employment in making rugs and mats, and picking oakum; and prison artizans are permitted to follow their respective trades of carpenters, tinmen, blacksmiths, brushmakers, &c. The number of separate cells is only 250, and the surplus inmates are consequently put into general dormitories.

The House of Detention, Clerkenwell, is used to receive prisoners awaiting their trial at assizes. It has cells for 300, only half of which are usually occupied. The building was newly erected, in 1844, having been before rebuilt, namely, in 1818, and first erected in 1775. The cost of the present structure is stated at £28,000. The prisoners (who are commonly kept here only about seven days) are strictly separated from each other, without employment of any kind. Experiments have been made to furnish it, but they are said to have failed. The machinery for employment cannot be fairly started during the brief stay of each prisoner, nor can his attention be effectually attracted to any useful pursuit, while his thoughts, hopes, and fears are excited in contemplating the chances of his trial.

Tothill Fields Prison was first erected in 1618, repaired or enlarged in 1655, and rebuilt in 1836. It is situated in Westminster, between St. James's Park and the Vauxhall Bridge Road, and is a building of great extent and strength. It is, however, very badly arranged, the *radical* principle, as illustrated at Pentonville and other prisons, being utterly neglected, and the detached buildings, which compose the entire prison, being, for all practical purposes of control, really so many separate prisons. The silent system is strictly observed during the day; but the separate sleeping cells being only 270 in number, while the prisoners are frequently more than 800, the rule is inevitably liable to be broken during the night, when from 40 to 80 prisoners are congregated in each general dormitory, with one officer in each. No kind of employment is afforded to the prisoners, except the picking of oakum, and working the treadwheel, both of which should be at once abolished from every well-conducted prison.

Newgate is the most grim of all the misbuilt London prisons, as described also in pp. 753, 754. Its exterior architecture, however, has been much admired by foreigners. It is used for the safe custody of those who are awaiting trial or punishment, the only permanent prisoners being those convicted of assaults or offences on the high seas, and those whose tenure of existence is limited by the sentence of death. The average annual number of the inmates of Newgate is about 3000; the greatest number at one time being about 500, when the assizes are approaching, and the prison being nearly empty immediately after the proceedings of the Central Criminal Court have committed the convicts to the prisons, penitentiaries, the houses of correction, or to Millbank. The first stone of the present building was laid in May, 1770, but the works proceeded slowly until, in the riots of 1780, the old gaol was destroyed, after which the new structure was rapidly completed. The entire building is dark and close, with little air, and less light. The only separation observed is of the prisoners into felons and misdemeanants; contaminating communication is freely permitted, and no work or employment of any kind is afforded to the prisoners.

Two of the metropolitan prisons are under the jurisdiction of the City or Corporation of London. These are Giltspur-street, or City House of Correction, and Bridewell.

Giltspur-street Prison comprehends two distinct divisions, viz. the House of Correction, and the Compter. The latter is situated as stated in p. 753, and appropriated for *detenus* of various kinds, as remands, those committed from the police courts, and, generally, persons awaiting trial, and therefore still unconvicted. The House of Correction is used for minor offenders within the City of London. None of those sentenced to transportation or imprisonment beyond three years, are received here. The entire gaol has only 36 separate sleeping-rooms. According to the calculation that *three* persons can sleep in small unventilated cells which were built for only *one*, being *about half the size* of the model cells for each prisoner in Pentonville, the prison may hold 203 prisoners. The return for Michaelmas, 1849, however, showed that it then contained 246! The consequence is that *five* human beings are sometimes locked up in one of these miserable cells for 12 or 14 hours out of every 24! No employment, no classification, no arrangement, no discipline, nothing, in short, but disgusting communication between the prisoners, oakum-picking, and the tread-wheel. The entire thing is a foul and pestilent disgrace to the City of London. A new city prison, which, it is understood, will eventually supersede Giltspur-street Prison is now being erected at Holloway, and will, it may be hoped, be as distinguishable for its excellences as the present one is for abomination of all kinds.

Bridewell, situated on the west side of Bridge-street, Blackfriars, about midway between Fleet-street and the Thames, is a prison to which those summarily convicted of offences within the City of London, and apprentices sentenced to solitary confinement, are consigned. Its antiquity, &c., is described in p. 753. Special provision is made for the latter class of delinquents, but their importance as prisoners seems to have much declined during the last generation or two. When they do, however, receive condemnation to this prison, they are placed in small cells, closed in with double door, and thus effectually separated from seeing, hearing, or associating with the poorer class of vagrants and misdemeanants, who share the same roof with them. The site of Bridewell is cold and damp, and the building is necessarily unhealthy. It is, moreover, ill arranged, and by no means adapted for the enforcement of any sort of discipline or system. The cells and corridors are dark and grievously wanting in light and air, and although each prisoner has a separate sleeping-place, they are allowed to associate much after their own fashion during the day. The only occupations are picking oakum, and treading the wheel, and at these silence is enjoined, but not enforced. The number of prisoners is usually about 100.

Attached to Bridewell Prison is an institution called the House of Occupation, in St. George's Fields, Southwark, which, while being really an industrial school, adapted for about 200 inmates—half of each sex—and not a criminal establishment, receives occasionally from Bridewell such juvenile delinquents as the magistrates think it desirable to remove from that City pesthouse.

Besides the prisons we have thus enumerated, there are two others which, although belonging to the county of Surrey, and being not properly metropolitan establishments, are yet situated so closely to London, that they require a passing notice in this place, in order that the visitor to the great metropolis may have intimation of all the prison-like institutions it may be in his power to visit. The two here referred to are known as Horsemonger-lane Gaol, and Brixton House of Correction.

Horsemonger-lane Gaol is situated on the south side of Newington Causeway, and has the entrance in Horsemonger-lane. It is a common gaol for the county of Surrey, under the jurisdiction of the Sheriff, Court of Quarter Session, and thirteen visiting magistrates, and was built at the suggestion of the admirable John Howard. This prison consists of two portions, one occupied by debtors, and the other by criminals, or those arrested on criminal charges. These two divisions are of course totally distinct, and no communication is permitted between their respective occupants. The debtor part of the prison is sufficiently like the debtors' prison already described to need no individual description here. The criminal part of the prison appears deficient in all that constitutes the features of a well-conducted prison. There are ten wards for the criminals, each of which wards has its yard and day-room. Each day-room serves to contain from 30 to 40 prisoners, of all ages and varieties of crime, left unobserved by any officer, and being denied neither the sight of their fellow-prisoners, nor free and contaminating oral intercourse with them. Employment and instruction are alike neglected, and picking oakum, and treading the wheel, are the only occupations found for the listless and degraded creatures gathered in this ill-conducted and crime-teaching prison. In the female department, which is adapted for only 28 occupants, more than double that number are sometimes crammed, and the consequence is that the miserable board, 15 inches wide, provided as a *sleeping-place,* in each cell, is unavoidably vacated, and the *stones* of the cell floor are adopted as a resting-place by the two, or even three hopeless creatures committed to it, in order that they may share the one blanket provided to shelter them during the long cold hours of night!

Brixton House of Correction, situated on the summit of Brixton-hill, about four miles to the south of London Bridge, is the other metropolitan house of correction for the county of Surrey. It is adapted for 185 prisoners, having 149 separate cells, and 12 cells adapted for three persons each. The number of prisoners usually *accommodated* is, however, about 400! The consequence is that the separate cells, each 8 ft. by 6 ft., and unventilated, are filled with three persons each (the law not allowing two in one cell). And in the women's department of the prison, the 35 cells are said to be sometimes crammed with 120 to 130 prisoners. Discipline, system, and all other desirable features, which such an establishment should present, are of course utterly absent in this wretched and unregulated house of contamination.

Somerset House, east of Waterloo Bridge, is a large unfinished pile occupied by public offices (see also pp. 200–203), replacing and named after a mansion built by the Protector Somerset, brother-in-law of Henry VIII., called *Somerset Place*, no vestige of which remains. On his attainder, this mansion became confiscated, and has remained crown property ever since. James I. and Charles I. enlarged and beautified it, with additions by Inigo Jones, our first classic architect, whose river front was very celebrated, and has served as a model for those of two modern buildings, the County Fire Office, at the top of Lower Regent Street, and Cliefden House, near Maidenhead, lately remodelled by Mr. Barry, R.A. Charles I. assigned Somerset Place to his Queen, and it remained the possession of the Queens of England till 1775, though never their residence after 1692. It became, like other deserted palaces, divided into lodgings for the poorer persons of the Court; but on the purchase of Buckingham House, by George III., for the purpose of converting it into a Queen's Palace, Somerset House was demolished, and Sir William

Chambers designed the present fine structure. Its plan, views, and architectural character having been given under "Architecture" (pp. 200–202), we need only here notice its chief apartments. The *Royal Society*, *Society of Antiquaries*, and the *Astronomical* and *Geological Societies*, have rooms in the northern part. The Royal Academy also was, for fifty years after its foundation, accommodated in the rooms west of the entrance, now occupied by the Government *School of Design.* The rooms of the Royal Society are entered through the corresponding door in the east side of the arcade entrance (see page 547).

The largest portion of space is devoted to the business of the *Admiralty*, which is divided between this and Ripley's unsightly building at Whitehall. Next to this in importance are the offices of *Stamps*, of *Taxes*, of *Excise*, of *Legacy Duty*, of the *Poor Law* Commission, the *Tithe* Commission, the estates of the Prince of Wales as *Duke of Cornwall*, the *Audit* Office, and that of *Registrar-General* of births, deaths, and marriages. About 900 clerks are employed daily in these offices from 10 to 4.

The east wing of the river front forms one extremity of *King's College*, which, on condition of thus completing the long unfinished front, was allowed to occupy part of the ground embraced by Sir W. Chambers's design for this fine building, and thus it can never now be finished. The feeling which left the crane standing on Cologne Cathedral is unknown in this country.

SPENCER HOUSE, *Green Park*, the entrance in St. James's Place. A mansion built for the first Lord Spencer, by Vardy, the architect (as some say) of the Horse Guards; and externally, one of the very finest houses in modern London. On the front towards the Park, which is of Portland stone, with attached columns, and a pediment quite in the style of Palladio, are three finial statues, praised by Sir W. Chambers for their uncommon grace and fitness to their situation.

SQUARES are an excellent feature, peculiar to the large towns of England, but more particularly to London, being distinguished from the *Piazze*, *Plazas*, *Places*, &c., of continental cities, by having originated in a sacrifice of building-ground, not to the purposes of ornament and architectural beauty, but to the pure necessity of ventilation. They are, therefore, in the newer parts of London, more numerous and larger than in other capitals, but not appended to any public buildings (which usually hide in obscure secondary streets), and not making any pretension to more adornment than the ordinary dwellings. A garden inclosed by open railing serves to hide the ugliness of sham art, refreshes the eyes wearied with the sombre monotony of our rude dwellings, and, though occupying some of the space, hardly impedes the circulation of air, but, according to modern chemists, actually helps to renew its vital principle.

Inigo Jones endeavoured to introduce a taste for something like the

Italian piazze, and began that of *Covent Garden*, a near imitation of that at Livorno, which some attribute to him; but only a portion was built with his arcaded frontage; that portion has since been pared down to the extreme of meanness, and the area itself, perverted to a market, disfigures the neighbourhood it was to adorn, and pollutes the air it was to improve. His next attempt of the same kind, *Lincoln's Inn Fields*, has been more fortunate, remaining still the largest ventilation of London, next to its parks (more important even than they, from its central situation), and now by far the best grown with timber. The equilateral form of this prototype of our squares has been pretty generally followed in all of them till within the last twenty years, but we now have them of all proportions, up to a lengthy slip, besides one oval (*Finsbury Circus*), and many semicircles or segments called *crescents*. For all rectilinear figures, even triangles, the term *square* is retained. The site of London being, unlike that of other capitals, unfortunately composed chiefly of large undivided estates, and the supply of houses and streets by the hundred a matter of wholesale speculation, of course the quantity of ground appropriated to these ventilators is merely calculated so that the increased rental of houses enjoying the sight of a tree, may compensate for the loss of ground from the immediate purposes of the speculator; and hence the proportion these gardens bear to the whole area in any district, is a measure of the value there set on this privilege. The same misfortune which banishes from our urban architecture the attributes of durability and beauty, and nearly forbids any advance in that of salubrity, insures us, however, the advantage of more of these openings than could be expected where the ground is minutely divided; and also affords a chance of more regular and extensively designed arrangements of streets. This last beauty, however, parsimony of invention has hitherto prevented. If we except a small region north of Hyde Park, a triangle inclosed by that park, the Edgeware and Grand Junction Roads, we have no instance of that studied symmetry and variety in street-planning which the classic taste of Wren and Evelyn vainly endeavoured to introduce into the city after the fire, and for which the size of the suburban estates, and vast scale of the operations on them, might be supposed to present opportunities unequalled in modern times.

The following are the chief Squares of the older class (rectangular with their sides nearly or quite equal), with the approximate area of each in acres:—Lincoln's Inn Fields, 12; Russell Square, 10; Belgrave, 10; Grosvenor, 7; Portman, 7; Park Square, Portland Place, 7; Euston, 7; Finsbury, 6; Bedford, 6; Tavistock, 5; Gordon, 5; St. James's, 5; Brunswick, 4; Mecklenburg, 4; Bloomsbury, 4; Cavendish, 4; Hanover, 4; Fitzroy, 4; Soho, 4; Eccleston, 4; Warwick, 3; Golden, 3; Manchester, 3; Dorset, 3; Blandford, 3.

Among those of an oblong shape, are—Eaton Square, 15; Chester, 5; Berkeley, 5; Lowndes, 4; Hyde Park Square, 4; Oxford, 3; Cambridge, 3; Montague, 3; Bryanstone, 3; Torrington, 3; Queen Square, Bloomsbury, 3; Red Lion, 3; Woburn, 3; and a great number in the newer suburbs.

Openings, of other regular forms:—Finsbury Circus, 4; Park Crescent, Portland Place, 4; Mornington Crescent, Hampstead Road, 4; Burton Crescent, 3; Wilton Crescent, Knightsbridge, 3; and many smaller.

Places of irregular forms:—Smithfield, 5; Trinity Square, Tower Hill, 5; Charter House Square, 3; Trafalgar Square, 4.

Thus these openings afford, in the dense parts of the town alone, more than 200 acres, or about half the area of the whole walled City, or of the present Hyde Park.

All openings exceeding an acre or two have now been planted with railed gardens, except Smithfield and Trafalgar Square. The latter, while making more architectural pretensions than any other, is greatly in want of some foliage, which the very expensive levelling and paving lately finished seems to forbid. A single flight of steps in the centre of the terrace would, besides being grander than the present ones, have enabled the corners to receive small shrubberies, for which this artificial stone-quarry now affords no convenient place.

TEMPLE (*The*), between the western part of Fleet Street and the Thames. The site of the establishment of the Knights Templars, who moved to this spot in 1184, from Holborn. On the dissolution of their order in 1313, it passed, after some changes, into the hands of the Hospitallers, another of the military orders who had not yet "decayed through pride," who, having their chief establishment at St. John's, Clerkenwell, leased this possession to students of the common law, who to this day are its occupants. The whole became divided into three inns: the *Inner* Temple (nearest the City), the *Middle*, and the *Outer* Temple; but only the two former names are now retained, and applied to two legal societies. The buildings throughout the district are modern, except one of great interest, the original *church* (see "Architecture," pp. 135–139), which is common to both societies; and the *Middle Temple Hall* (see p. 506).

TEMPLE BAR (see "Archways"). This was erected by Wren, together with a gate called Holborn Bar, whose name only now remains, to mark the western limits of the City Liberties; which extend in every direction (except at the east extremity, or Tower Hill) far beyond the old circuit of the walls; and in this direction a full half mile beyond the corresponding gates, Ludgate and Newgate. The other *Bars* were merely toll gates. Temple Bar is closed only on the occasion of the Sovereign entering the City, when a parley takes place, to show either the Lord Mayor's power to exclude, or willingness to admit, his visitor.

THEATRES.—The four chief are,—

1. *Drury Lane*, in Great Russell Street, Covent Garden.

2. *Covent Garden*, now frequently called the Royal Italian Opera, Bow Street, Covent Garden.

3. *The Lyceum*, or English Opera House, Strand, near Wellington Street.

4. *Her Majesty's Theatre*, or Italian Opera House, Haymarket.

For accounts of these, see article "Music" (pp. 617–21).

The remaining ones on the Middlesex side of the river, with their times of performance and prices, are as follows:—

5. *Haymarket Theatre*, nearly opposite the Italian Opera House, originally built in 1720–21, by Potter. The present theatre was constructed by John Nash. Performance begins at seven. Boxes and stalls, 5*s.*; pit, 3*s.*; gallery, 2*s.*; upper gallery, 1*s.* Second prices at nine, boxes, 3*s.*; pit, 2*s.*; gallery, 1*s.*; upper gallery, 6*d.*

6. *Adelphi Theatre*, opposite Adam Street, Strand. Mr. John Scott, colour maker, of the Strand, was the original projector, and under his superintendence it was built in 1806. Performance at seven. Boxes, 4*s.*; pit, 2*s.*; gallery, 1*s.*; half-price at nine.

7. *Prince's*, or *St. James's Theatre*, built by Mr. Beazley, King Street, St. James's Street. Performance at half-past seven. Boxes, 6*s.*; pit, 3*s.* 6*d.*; gallery stalls, 3*s.*; gallery, 2*s.*

8. *Princess's Theatre*, north side of Oxford Street, between Tottenham Court Road and Regent Street. Performance at seven. Stall, 6*s.*; dress circle, 5*s.*; boxes, 4*s.*; pit, 2*s.*; gallery, 1*s.*; half-price at nine.

9. *Sadler's Wells Theatre*, originally founded about 1685, St. John's Street Road. Performance begins at seven. Dress circle, 3*s.*; boxes, 2*s.*; pit, 1*s.*; gallery, 6*d.*

10. *City of London Theatre*, Norton Folgate, Bishopsgate Street, nearly opposite the Eastern Counties Railway, built by Mr. Beazley. Performance at half-past six. Boxes, 2*s.*; pit, 1*s.*; gallery, 6*d.*; half-price, at half-past eight, to the boxes only.

11. *Strand Theatre*, 168, Strand, projected about 25 years since by Mr. Rayner, the comedian. Performance at seven. Boxes, 3*s.*; pit, 1*s.* 6*d.*; gallery, 6*d.*; second prices at nine.

12. *Olympic Theatre*, Wych Street, Strand, originally built by Philip Astley, in 1805; recently rebuilt. Performance at seven. Boxes, 4*s.*; pit, 2*s.*; gallery, 1*s.*; half-price at nine.

13. *Marylebone Theatre*, Church Street, Paddington. Performance at seven. Best boxes, 4*s.*; second, 3*s.*; common boxes, 2*s.*; pit, 1*s.*; gallery, 6*d.*; second prices at nine.

14. Miss Kelly's *Soho Theatre*, Dean Street, St. Anne's, Soho, for amateur performances. Admittances vary.

15. *Fitzroy*, or *Queen's Theatre*, formerly called the Regency Theatre, Tottenham Street, Tottenham Court Road.

16. *Royal Standard Theatre*, Shoreditch.

17. *Royal Pavilion Theatre*, Whitechapel.

On the Surrey side of the river are:—

18. *Surrey Theatre*, Blackfriars Bridge Road, first opened in 1782; rebuilt and opened in 1806. Performance begins at half-past six. Boxes, 2*s.*; pit, 1*s.*; gallery, 6*d.*; half-price at half-past eight, to the boxes only.

19. *Victoria Theatre*, originally called the Coburg, Waterloo Bridge Road. Performance at half-past six. Boxes, 1*s.*; pit, 6*d.* gallery, 3*d.*

20. *Astley's* (now *Batty's*) *Amphitheatre*, for equestrian performances, Westminster Bridge Road, built in 1780, by the late Philip Astley, an uneducated but enterprising man. Performance at seven. Stalls, 5*s.*; dress boxes, 4*s.*; upper boxes, 3*s.*; pit, 2*s.*; gallery, 1*s.*; upper gallery, 6*d.*; second prices at half-past eight.

Dramatic representations have followed the same course in England as in other civilized countries, and, like other works of ornament or luxury (perhaps more distinctly than others), have reflected and registered the whole history of national taste and culture, in its progress from pristine barbarism or rudeness up to its height of refinement, that is, to the state in which the intellectual requirements attain their utmost importance and predominance over the material or sensuous; and from this again towards the second state of rudeness, in which the external and material re-asserts and gradually regains its original ascendancy.

Our drama, like our other ornamental arts, originated in the Church, and is traceable back to the sacred and legendary play that in the fifteenth century augmented the attractions of the cathedral and abbey, whose services (undergoing in the course of ages all the changes that the performances of the theatre have since done) had at length passed into these gorgeous spectacles. From the church, these representations naturally passed to out-of-door amusements, and *Clerkenwell*, then a clear spring, outside the city, received its name from "the parish clerks in London, who, of old time, were accustomed there yearly to assemble, and to play some large history of Holy Scripture." In 1409, we read of their playing one which lasted eight days, "and was of matter from the Creation of the World." Gradually these dramas deviated from scriptural story, and some began to be founded on other history and tradition; and having after the Reformation assumed a purely secular character, plays were acted in the houses of the great, by their servants, till at length the amusement passed into an art, and the art into a distinct profession; and, in Queen Elizabeth's time, buildings arose specially constructed for it. These theatres, which stood on pieces of waste ground, about the river banks and the suburbs, were octagonal structures of wood, tapering upwards, with windows on every side, and a thatched roof covering the galleries and stage, the centre over the pit being open to the sky, for no artificial light was used, the general time of performance being three o'clock. Scenery was not always painted, words answering the purpose with much saving of trouble. Thus we hear of "*Thebes* written in great letters on an old door;" and in a superior performance, towards the end of the sixteenth century, the audience were told in the same manner, to "*suppose the Temple of Mahomet.*" Such were the simple appliances that sufficed for that public whose tastes demanded and called forth a Shakspeare. In 1613, however, on the occasion when the famous Globe Theatre was burnt down, by some gun-wadding alighting on the thatch, Shakspeare's *All is true* (the first title he gave to his Henry VIII.) was "set forth with many extraordinary circumstances of pomp and majesty, even to the matting of the stage; the knights of the order with their Georges and garters, the guards with their embroidered coats, and the like, sufficient, in truth (says Sir H. Wotton), within a while to make greatness very familiar, if not ridiculous." About the same time, some theatres began to be roofed entirely over, while the same progress of popular taste which called for these "circumstances of pomp and majesty," rested satisfied with the productions of writers as inferior to the great sun of the English drama as they shine superior to the stars of later times.

In 1640 the Long Parliament suppressed all plays, as inconsistent with a time of public calamity; and as the order gradually began to be evaded, in 1647 more stringent measures were thought necessary, and all convicted of acting were treated as rogues, and publicly whipped. This drove the whole of them of course into the Royalist party, and put an end to the stage till after the Restoration, when it reappeared pretty much in its present form. Females then first took part in the performances, which have ever since been by artificial light. Under Charles II. play-going became especially fashionable as a sign of loyalty. Drury Lane Theatre was founded in 1663, burnt down in 1672, and then rebuilt by Wren. Many others arose soon after, which are no longer in existence. In 1705 was opened the "Haymarket Theatre," as it was then called, on the site of the present Opera House. The projector was Sir John Vanbrugh, architect and dramatist. In 1720 was begun the "*Little* Theatre in the Haymarket," on the site of the present Haymarket Theatre. To this was afterwards extended the patent enjoyed by the great theatres alone, of representing the legitimate drama, which restriction has only recently been relaxed. Sadler's Wells dates as a place of amusement from the time of Charles II. On becoming a theatre, it was long appropriated to sea-pieces, from the facility of obtaining real water from the adjoining New River. The Shakspearean drama, now banished from the greater theatres, has taken refuge in this little edifice, which was the first to take advantage of the extension of their privilege, and now produces the highest style of

English plays with great success. St. James's (or the Prince's) Theatre has the neatest and most appropriate exterior (Beazley, architect), and a handsome interior. It is now generally devoted to French plays. The Princess's (T. M. Nelson, architect) is considered to have an interior peculiarly commodious and neatly decorated.

Astley's Amphitheatre, so called after the equestrian who founded it, originated in an open riding ring, to the rails of which, in 1774, persons were admitted on payment of sixpence. It was afterwards covered in, and after several conflagrations and rebuildings, has assumed its present appearance, and become a favourite exhibition with all classes.

21. *Vauxhall Gardens*, Surrey, near Vauxhall Bridge, long a favourite place of public amusement, in which music, singing, and ballets are performed during the evenings of the summer months. Admittance varies; sometimes 1*s*., and at other times 2*s*. 6*d*.

22. *Cremorne Gardens*, King's Road, Chelsea, on the north bank of the Thames, near Battersea Bridge; day and evening amusements of concerts, ballets, and sometimes equestrian performances. These gardens are very numerously attended. Admittance, 1*s*.

The *Eagle Tavern*, City Road, near St. Luke's, Old Street, has a theatre, or saloon, in which there are opera performances, vaudevilles, ballets, and other dramatic performances. Admission, 1*s*.

There are many others of a very minor description. The stranger is directed to the morning journals for the advertisements of the performances, and their particular days or evenings of performance. These advertisements are generally classed and inserted just preceding the principal articles in each newspaper.

Tower of London, at the eastern extremity of the city; a castle of the Norman kings, afterwards made a state prison, and now a mere fort and arsenal. It is probable that so usual a defence as a fort at the termination of the wall on the river side, guarding the approach of the town from the sea, would not be omitted on the first walling of London, in the fourth century, by Theodosius, or, as some say, by Constantine. A high authority, however, seems to assign it a still earlier foundation.

> "Prince Edward. I do not like the Tower, of any place.
> Did Julius Cæsar build that place, my lord?
> Buckingham. . . He did, my gracious lord, begin that place,
> Which since succeeding ages have re-edified.
> Prince Edward. Is it upon record, or else reported
> Successively from age to age, he built it?
> Buckingham. . . Upon record, my gracious lord."—
> *Richard III.*, Act III., Scene 1.

This record, however, has not, since Shakspeare's time, been exhibited, and the earliest we now have is that of the erection of the present keep (the *White Tower*) for William the Conqueror, by his famous engineer and leader of the Church militant, Bishop Gundulph. This building is fully described under "Architecture" (pp. 128–131).

William did not complete the circuit of outworks, now the *inner* ward, nor does it seem to have been finished till the reign of Stephen. The *outer* circuit, and the defences to the western gate, were added by Henry III., about 1240; but nothing beyond plain masonry can now remain of that date, except perhaps the pillars only in St. Peter's Chapel. The only external architectural features remaining are evidently of the fifteenth century, and are confined to the two southern entrances; of which the outer or lower is known as "*Traitor's Gate*," now approached from the river, through an archway in the modern quay; and the inner is the "*Bloody Tower*," the traditional scene of the murder of Edward V. and his brother. The round bastion adjoining this, on the east (called the *Wakefield Tower*), retains a handsome Gothic octagonal room, but nothing externally. All the towers to the inclosure of the inner ward have their names and their traditional associations, but the most interesting is that in the middle of the west side, called the *Beauchamp Tower*, the lodging, in the sixteenth century, of many famous prisoners (the unfortunate Queen Anne Boleyn; John Dudley, Earl of Warwick, 1553; Philip Howard, Earl of Arundel, 1587); who have, with many others, left inscriptions scratched on the walls. The *Brick Tower*, the first proceeding westward from the north-east angle, was the prison of Lady Jane Grey; and the *Bell Tower*, the first eastward from the south-west angle, that of Queen Elizabeth; both confined here at once, soon after Mary's accession. Other parts that have been prisons contain inscriptions by their occupants; and the *Salt Tower*, at the south-east corner, a curious planisphere, engraved by Hugh Draper, confined on suspicion of magic, in 1561.

None of the interesting old rooms, however, are generally accessible, except the ground floor of the Beauchamp Tower, and one small apartment in the White Tower, known as *Queen Elizabeth's Armoury.* This vault, which is entered through the modern Horse Armoury, is situated under St. John's Chapel (see page 130), and being surrounded by walls 17 feet thick, supporting the whole width of the chapel aisle, it is the strong room of the fortress. In the thickness of one of its walls is formed a small dark dungeon, famed as that of Sir Walter Raleigh, and in this are several prisoners' inscriptions, of which three are left uncased for the inspection of visitors.

> "He that indvreth to the ende shall be savid.—M. 10. R. Rvdson, Kent. An^{o}. 1553."
> "Be faithful vnto the deth, and I wil give thee a crowne of life.—T. Fane. 1554."
> "T. Cvlpeper of Darford."

These persons were concerned in the insurrection of Sir Thomas Wyatt.

The Chapel of St. Peter ad Vincula, still the parish church of the fortress, has nothing remarkable but having been the frequent, though not the general, burying-place, of those beheaded on Tower

Hill, or (when popular feeling rendered that dangerous) within the fortress, on the adjoining green, now paved. Here were interred without a memorial (in the time of Henry VIII.), Fisher, Popish Bishop of Rochester; the Queens Anne Boleyn and Katherine Howard; Sir Thomas More ("in the belfrey, or, as some say, as one entereth into the vestry, near unto the body of the holy martyr Bishop Fisher"); Thomas Cromwell, Earl of Essex; and Margaret, the heroic Countess of Salisbury. In the time of Edward VI.—the Lord Admiral Seymour of Sudley, beheaded by order of his brother, the Protector Somerset; and the Protector Somerset himself. In the reign of Mary—the Duke of Northumberland (before the High Altar, "two Dukes between two Queenes, to wit, the Duke of Somerset and the Duke of Northumberland betweene Queen Anne and Queen Katherine, all four beheaded"); Lord Guildford Dudley, and his wife, Lady Jane Grey. In the reign of Elizabeth—the Earl of Essex. In the reign of James I.—Sir Thomas Overbury, poisoned. In the reign of Charles I.—Sir John Eliot (died a prisoner). In the reign of Charles II.—Okey, regicide. In the reign of James II.—the Duke of Monmouth (the tradition of a *substitute* having suffered in his place has furnished a base for some romance). In the reign of Queen Anne—John Rotier, the eminent engraver; and lastly, in 1746–7, the Lords Kilmarnock, Balmerino, and Lovat, concerned in the affair of the Pretender. There are four monuments to Lieutenants of the Tower, the first of the time of Henry VII.

"I cannot refrain," says Macaulay, in his *History of England*, "from expressing my disgust at the barbarous stupidity which has transformed this interesting little church into the likeness of a meeting-house in a manufacturing town." What will be said of the taste that, within the last few years, has transformed nearly the whole of this historic fortress into the semblance of a manufacturer's "castellated" villa? The bricklayer's patchwork, and the Louis Quatorzine building of Wren, destroyed by the fire of 1841 (on the site of the present great barrack, north of the White Tower), were, no doubt, painfully incongruous. But what made them so? Why, precisely the qualities that, immensely exaggerated in the buildings that replace them, render these infinitely *more* incongruous; not their plainness, not their ornament, not their finish or their rudeness, not even their meanness or their different style of decoration, but simply its *fictitious character*. The old keep, that seems to look down with such ineffable contempt on these romantic battlements, belongs to a period long before buildings, or any features of them, had begun to pretend to be aught else than they are. It survives a long descending series of continually accumulated fictions and pretences; but in all this far-spun progress from false to more false, we had never arrived, nor has any other nation yet arrived, at the pitch of untruth embodied in these last additions. Other times and countries, however necessary they might find the amusement and excitement of antique scenery, have yet had reverence enough not to thrust it under the nose of antique reality. In the old world, even Hadrian, the greatest patron of "restorations" and mock-antiques, who had all the wonders of the world reproduced in his villa, abstained from displaying them in the Capitol; and at the present day, even in China, the land of fictions—the land of sham forts—the land of make-believe wildernesses—they have not, as far as we can learn, arrived at the exquisite refinement of a sham castle elbowing a real one for "uniformity of style."

Uniformity of style! why, there are not two styles in the world so opposite as one without pretence, or even ornament, and one whose ornaments are *all* pretence. To be uniform with the old, the new Tower would have had to be treated as we suggested a modern prison might be (see p. 754); but this real conformity to the style of the old Tower would here also have been unpractical (according to the present use of the word), because, though effecting much pecuniary saving, it would have effected the reverse of a saving in thought and trouble; though much cheaper than the present treatment, it would have been much more difficult, and moreover have made no show after all. The recent additions render this "lion" a more attractive one than it ever had been since the live lions were removed. The visitor is now both amused and reminded of past ages, by the completeness of the characteristic scenery, the crenellation even of the very chimney-pots, the wide social bay-window and cautious loophole (side by side), the bold machicolations, the corbel and gargoyle monsters, all trying so hard to frown, that the effort is even more striking than the effect. Everything connects the present with the far past, and tells of distant and widely-differing ages.

For viewing the collections of mediæval armour, and the Queen's regalia, tickets must be bought at the outer western gate. There is one ticket for the armouries, and one for the jewels, price 6*d*. each. The warders (who retain the dress of Henry VIII.'s guard) conduct visitors through both collections, as soon as a party of twelve are collected, or otherwise every half hour, from 10 to 4.

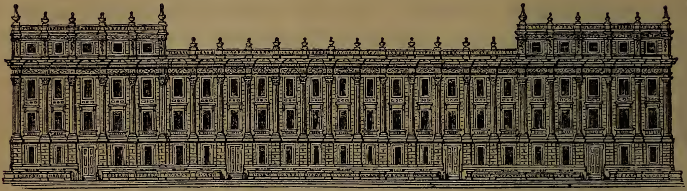
The *Horse Armoury*, in a modern building attached to the south of the White Tower, contains twenty-two equestrian figures, in the armour of different periods from 1272 to 1688, arranged chronologically; but there is, in general, no authority for believing the suits to have belonged to the persons whose names they bear, except in the later instances, Henry VIII. and those after him. Some other very interesting suits are in other parts of the gallery, as—a Saracen suit, the oldest here, being prior to the time of Edward I.; a fine suit of the time of Henry VIII., formerly attributed to John of Gaunt; a suit rough from the hammer, of the same age; a headpiece, supposed to have belonged to Henry VIII.'s fool; a carved ivory warder's horn; a helmet, and other arms of Tippoo Saib; and a splendidly wrought Maltese cannon. From this gallery you ascend into the ancient room under the chapel, above mentioned, called *Queen Elizabeth's Armoury*, from its containing some spoils of the great Spanish Armada. Among these is the "iron coller of tormente," and for the same purpose are the thumbscrew, and the cravat, or "scavenger's daughter." The various early shields, and the curiously combined and elaborately adorned arms of Henry VIII.'s time, are all well worth inspection; and the visitor should not neglect Raleigh's dungeon and the inscriptions at its entrance.

Outside, lying on the south of the White Tower, are many curious cannon, of various ages, almost ever since their invention. They were formerly in the great modern armoury, on the burning of which, and destruction of its vast stores, in 1841, many of them received the injury we now see.

The *Jewel-house* is a new building, erected for the convenient exhibition of the regalia, which were formerly kept in an adjacent bastion, the Martyn or Jewel Tower, and have been shown to strangers since Charles II. tacitly allowed their keeper to do so, as a substitute for some perquisites which his office had lost. These jewels nearly all date since the Restoration; all those ancient ones which contained "crucifixes or superstitious pictures" having fallen a prey to Puritan zeal. The plainest Sceptre, or rather Staff, and the great Crown, though named "St. Edward's," after Edward the Confessor, are known to have been made for Charles II. The only remnant of the old regalia is thought to be the Anointing Spoon. The other articles used at every coronation, are—the Ampulla, or eagle-shaped receptacle for the oil; the large Sceptre, terminating in a cross; the Bracelets; the Spurs; the greater Orb; the blunt Sword of Mercy; and the two sharper ones of Justice, Ecclesiastical and Temporal. For the coronation of a Queen Consort, there are a smaller Crown, Sceptre, and Orb. Two other Queen Consorts' Sceptres are here: one of ivory, made for Marie d'Este, Queen of James II.; the other found behind the wainscoting of the old jewel-house, in 1814, and supposed to have been made for Mary II. The plain circlet of gold was made for Marie d'Este; and the present State Crown, of silver and diamonds, for the coronation of her present Majesty. It contains a great ruby and sapphire, the former said to have been worn by the Black Prince. The present Prince of Wales's Crown, of gold without stones, is modern. The remaining regalia are—the golden Salt-cellar, in the shape, it is said, of the White Tower; a silver Wine-fountain, presented to Charles II. by the Corporation of Plymouth; and the silver Font, used at Royal Baptisms.

The Tower Menagerie, after being one of the most famous London sights for just six centuries, was removed to the Zoological Gardens, Regent's Park. It originated in three leopards presented by the Emperor Frederick II. (the greatest zoologist of his day) to

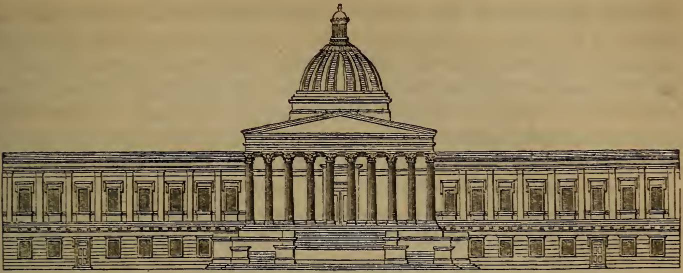
Henry III., in allusion to the three in the royal shield, since exchanged for lions, as were also their living representatives.



TREASURY.

Treasury Buildings, *Whitehall*, the richly-fronted building south of the Horse Guards, and extending to the end of the broad street of Whitehall, having a short return front towards Downing Street, contains the offices of the Privy Council, the Treasury, the Board of Trade, and the official residence of the Prime Minister. The Home and Colonial Offices, State Paper Office, and others, are contained in plainer buildings (partly erected for dwelling-houses) behind this handsome pile, and reaching to St. James's Park. The street front, usually known as either the Treasury or Board of Trade, has lately been brought to its present appearance by Mr. Barry, R.A., but cannot be taken as a fair specimen of his abilities, being an enlargement and patching up of the former edifice by Sir John Soane, which was designed with a view to extensive changes and improvements of the whole street and neighbourhood, to which (being incapable of completion while they retained their present form) it was for many years a disfigurement. This ambitious design being at length abandoned, and the architect of the present alterations being much cramped by the necessities of working in both the old site and the old materials, the result is highly creditable. The Soanean whims and conceits have disappeared, and the order, which is a reduced and simplified model of that of the Temple of Jupiter Stator, has, by the enrichment of the frieze and the addition of considerable ornament above it, been brought more into harmony with the building (or rather the building with it), which would have been impossible with less enrichment. The interior of the Treasury contains an old royal throne, but nothing else remarkable.

University College, *Upper Gower Street, Bedford Square.*—A proprietary place of education, founded in 1828, chiefly by the exertions of Lord Brougham. Its distinguishing peculiarity is that, by leaving all theological studies to be pursued elsewhere, it admits students of every religious persuasion indiscriminately. All subjects except theology are taught, and the medical department has gained much reputation. The degrees conferred by the London University are those of Bachelor of Arts, Bachelor of Medicine, Bachelor of Law, Master of Arts, and Doctor of Law.



UNIVERSITY COLLEGE.

The building (of which only the central portion has yet been erected) was designed by W. Wilkins, R.A., the architect of the National Gallery. Its other parts are quite overpowered and reduced to littleness by an immense Corinthian portico (stripped of all enrichment except the capitals), which, though the largest structure of the kind in England, is purely an ornament, having never been used even as an entrance. It is unfortunate that so pompous a feature should also be in such a situation that very few strangers can, in a cursory examination of the town, alight upon it. A miniature dome stuck upon its roof, though not having the extreme inelegance of that on the National Gallery, is equally disproportioned. The wings have the same diminutive character, all having been sacrificed to the exhibition of this very bald and starved giant portico; whose sole beauty, that of completeness and unity, is of course also sacrificed in tacking on the utilitarian necessities that, after all, could not be suppressed. The ornamentation of the wings is also unhappy; consisting in crowding between the windows (which might have sufficed) very shallow pilasters, miscalled antæ. We say miscalled; for the proper anta was not an ornamental *feature* (or addition), but simply a neat finish for obviating the rudeness of the abrupt termination of a wall. The occasion for it never occurs in modern building. We have, therefore, no use for the real anta; which, indeed, bears to the feature now so called exactly the same relation as a window to a sham window. Now these mock antæ are properly called *pilasters;* and (whether resembling their originals little or much, whether skilfully modified, as in the Roman architecture, or merely copied, as in ours) are entirely opposed to the character of Grecian art, which (like the early Gothic) employed *no* mock features.

WESTMINSTER, or ST. PETER'S MINSTER.—One of the most famous of the many hundred monasteries to whose gentle but long-continued and mighty influence England seems to owe, directly or indirectly, all her civilization, greatness, power, and wealth;—to whose abuse and fall *appearances* would trace all her modern blots and troubles; —to whose ruins, all that is truly great, noble, or beauteous in the artificial features of her material physiognomy—all that man has added to her face, in harmony with, or not destructive of, its natural beauties. For though the present age has produced the means of quicker transit from one spot to another, all that can attract or bind men to one spot, all that (besides nature's works) is worth using these means of transport or stopping on a journey to see and admire, was produced in the times of the lane and the pack-horse.

This minster of Benedictines was founded *in honour of Christ*, about A.D. 604-610, at the same time with the second St. Paul's Cathedral, by Sebert, first Christian King of the East Saxons; refounded on a greatly-enlarged scale, *in honour of St. Peter*, about 1050, by our third King Edward (afterwards sainted), the last of the old Anglo-Saxon monarchy, and opened by him with great solemnity, in 1065, a week before his death, and nine months before the Norman Conquest; founded a third time, *in honour chiefly of this St. Edward*, about 1245, by his admirer and imitator Henry III., who lived to complete the eastern arm, transept, and chapter-house of the present abbey church; proceeded with by his successor, Edward I., and by the abbots down to the time of its surrender to Henry VIII., on January 16, 1539-40; but never completely finished. Henry VII. rebuilt the eastern chapel, *in honour of himself;* and succeeding times have found the fabric convenient as a national Pantheon. The yearly value of the monastery at its seizure, according to Dugdale, was £3471 0*s.* 2½*d.*

The name of this minster has extended to all the west of London, the City of Westminster being now bounded on the east by that of London, commencing at Temple Bar; on the north by Holborn and Oxford Street; on the south by the Thames; and on the west by the parishes of Chelsea and Kensington. It returns two members to Parliament, and is governed by a High Steward and High Bailiff, nominated by the Dean and Chapter of St. Peter's Church.

WESTMINSTER ABBEY, now *St. Peter's Collegiate Church.*—The church of the monastery above mentioned, which, about a year after its surrender, was erected by Henry VIII. into a cathedral, the bishop, Thomas Thirleby, having for his diocese all Middlesex, with the exception of Fulham. He was the only bishop of Westminster, the diocese being ten years afterwards reunited to that of London. In 1556 Queen Mary refounded the monastery, which, on her death, three years after, was finally suppressed by the first Parliament of Queen Elizabeth, and the present collegiate establishment founded, together with the neighbouring celebrated school.

In the civil war, soldiers were quartered in the church, and reduced its interior to the present mutilated condition. The west front and towers, never having been finished, were carried up in the barbarous style we now see, during the first half of the last century. Wren made a design for this, and began the work, whence he has most unjustly received the discredit of the whole, most of which was not done till long after his death, and certainly not according to his intentions.

Some description of this glorious fabric having been given under "Architecture" (pp. 143–9), and of the older tombs and monumental additions to it (p. 150), we need here only mention the chief monuments, in the order in which they will be seen by the visitor, as he follows the verger round the parts east of the transept, to which parts the public are not admitted without such guidance, and the payment of sixpence. The remaining parts, which contain only modern monuments, are free between the hours of 11 and 3, and also in summer between 4 and 6, P.M., and the cloisters at all times. The entrance to attend divine service is either by the great north door, or by the little door in the south-east corner of the transept, called Poets' Corner; the exit by either these or the nave. The entrance at other times is by Poets' Corner only.

In proceeding round the eastern part of the building, the guide first introduces you to the square compartment inclosed by railing, called *St. Benedict's Chapel*, the south side of which retains one of the few fragments now left of the beautiful original decoration that extended all round the church. The east side is nearly filled by the tawdry pile of marble erected to Frances, Countess of Hertford, 1598. In the centre stands the tomb of Lionel, Earl of Middlesex, Lord High Treasurer under James I., 1645; and there are two other altar-tombs, that of Dr. Bill, Dean of this church, 1561, with a brass engraved figure; and the fine old Gothic one with an effigy, to Archbishop Langham, 1376. The mural recess and kneeling figure of Dean Goodman, 1601, is a specimen of the Elizabethan style of monument.

Proceeding along the aisle eastward, the next recess, of a polygonal or apsidal shape, entered through an ancient wooden screen, was called *St. Edmund's Chapel*, having an altar to that sainted king of East Anglia, who was massacred by the Danes, in 886. This also contains a few rich fragments of the church decoration; and just within the entrance, on the right, the altar-tomb of William de Valence, son of Isabel, relict of King John. He died 1296, so that the tomb is one of the oldest in the church. The lower part is of stone, with the arms of Valence and England alternately; the upper part and fine effigy, of oak, the latter covered with copper and enamelled with the same arms; but thirty-three figures of his relations, surrounding the oaken pedestal, have been destroyed. On the other side the entrance stands the detached tomb of John of Eltham, second son of Edward II., who died 1334. It retains his recumbent figure, and parts of the "weepers," or surrounding statuettes, finely cut in alabaster; but the beautiful stone canopy, once the finest in the church, has been demolished, leaving only the bases of the clustered buttresses, four on each side, which supported it. Adjoining is a small tomb with effigies of two infant children of Edward III., who died 1340. Under the westernmost window is a canopied tomb and effigy to Sir Bernard Brocas, Chamberlain (as the ancient brass inscription shows) to Richard II.'s first Queen, Anne of Bohemia, and beheaded for his loyalty to his master, in 1399. A modern inscription has been added by his descendants. In front of this is a low tomb, with the remains of a brass figure, to Humphrey Bourgchier, a Yorkist, slain in the battle of Barnet, 1470. Two engraved brasses in the pavement, one to Archbishop Waldeby, 1397; the other, the finest in London, to Eleanora, Duchess of Gloucester, 1399, complete the mediæval memorials, in which this chapel is peculiarly rich. Among the modern ones that disfigure it, the chief are—to Frances, Duchess of Suffolk, grand-daughter of Henry VII., and mother of Lady Jane Grey; to some members of the Russell family; to Bishop Monck, of Hereford, 1661; and to Mary, Countess of Stafford, 1719.

In coming out of this chapel, the visitor has just before him the very fine tomb of Edward III., whose basement and rich wooden canopy are here best seen; to the right, that of his Queen, Philippa; and to the left, that of Richard II. and his Queen.

The next apsidal recess, similar to the last, was the chapel of St. Nicholas. It is inclosed by an elaborate screen, of the age of Henry IV. The first tomb is on the right of the entrance, with a recumbent figure of Philippa, Duchess of York, 1431; the canopy has been destroyed. The next is under the middle window, to Bishop Sutton, or Dudley, of Durham, 1483, a rich monument, but which has lost the brass portrait. In the floor is a brass of Sir Humphrey Stanley, knighted for his conduct at Bosworth Field. The rest are modern monuments, of which the two most preposterous, each 24 feet high, commemorate Anne, Duchess of Somerset, wife of the traitorous Protector of Edward VI.; and the wife and child of the great Lord Burghley, 1588–9. Also an altar-tomb to the wife of Sir Robert Cecil, his son, 1591; a great tomb in the centre to Sir George Villiers and his wife, 1605-1632, the parents of the first Duke of Buckingham; and many others.

Leaving this chapel, we have before us the tomb of Queen Philippa; and proceeding under the vaulting that supports the gorgeous chantry gallery of Henry V., we ascend a flight of steps that leads up from the eastern extremity of the church, to the three elaborately-wrought metal gates of Henry VII.'s Chapel, which are well worthy of notice. The portcullis denotes Henry's descent from the Beaufort family; the entwined roses, the union of York and Lancaster on his marriage, terminating their long and bloody feud. The same devices are repeated in innumerable forms and situations.

Entering the middle aisle of this wonderful mausoleum, the visitor knows not what to admire first, or most. The fretted vault-work over head, "pendent by subtle magic;" the close array of saints ranged beneath the upper windows, many considered by Flaxman admirable works of art, and now nearly concealed by the banners of the Knights of the Bath; the elaborate wood-work of the canopies and stalls, wrought, as for more than mortal eye, alike in what is seen and what is unseen—carved even to the very under sides of the *misereres* or turning seats, whose unstable support (when turned up) was to insure the wakefulness of the religious, in their long night services;—how noble and real is all here! How unlike modern magnificence! How like that of nature, where everything disdains display—courts closer and closer inspection—is *more* than it assumes to be—*more* than it at first appears! Thus, in the words of a living poet,—

"In the elder days of art,
  Builders wrought with nicest care
Each minute and unseen part,
  For the gods are everywhere."

In the centre of the apsis or terminating sweep, stands the chantry inclosure of brass, still more richly wrought; and again within that, yet richer than aught else, the focus of the whole, the tomb of the royal pair; in the words of the King's will, "a Towmbe of Stone called Touche, sufficient in Largieur for vs booth: and vpon the same, oon Ymage of our Figvre, and an other of hers, either of them of Copure and gilte, of svche Faction, and in svche Maner, as shalbe thovght moost conuenient by the Discrecion of ovr Executours, yf it bee not before doon by ovrself in our daies." This, unfortunately (but this alone), was not done in his days, or by native artists. Hence the "faction and maner" are Italian, the work of Pietro Torrigiano, the same who is said to have flattened the nose of Michael Angelo; an injury which, it has been remarked, he might have very well expiated, by carrying back to the architect of St. Peter's (whose rude and artless structure has with the utmost difficulty been kept standing) some notions of refined and scientific building, of which, in stone, this chapel is the indisputable masterpiece.

At the head of the tomb is interred Edward VI., and in a plain vault under the chapel, constructed by George II., that monarch and several of the present royal family, without a memorial. In the five recesses surrounding the apsis, the fine old sacred sculpture and decorations have partly fallen a prey to hideous monuments of modern vanity. That of brass, to a Duke and Duchess of Richmond (*d.* 1623–39), in the south recess, is somewhat remarkable; and that in the south-east, to the Duke of Montpensier, brother of Louis Philippe, is by Westmacott.

We must return through the entrance gates, to gain access to the side aisles of this chapel, of which the southern is sometimes shown before the body. The principal tomb, in the centre of this aisle, displaying the taste of Inigo Jones, was erected by James I.

to his mother, Mary Queen of Scots. There are four others, specimens of the fashions of different times, viz.:—Margaret, Countess of Richmond, 1509; Lady Margaret Douglas, 1577; General Monk, 1670; and Horace Walpole's monument to his mother, 1737. Four sovereigns, Charles II., William and Mary, and Anne, with her consort, George of Denmark, are buried here without memorials.

In the north aisle, corresponding with King James's monument to his mother, is a still more sumptuous one, in the same bed-shape, erected by him to his two predecessors on the English throne, Mary and Elizabeth. At the extreme end are memorials to his two infant daughters; and between them a sarcophagus, in which Charles II. placed the supposed remains of the murdered princes, Edward V. and his brother, accidentally discovered in the Tower, in 1674 (*d.* 1474). In a vault without memorials are James I., his Queen (Anne of Denmark), and son Henry. Returning, below the Tudor Queens, the tawdry monuments to two Lords Halifax (1695–1719) are chiefly noticeable for the latter marking the undistinguished grave of his friend Addison, as worthy as any one of a place in Henry VII.'s Chapel.

With all the splendour of this royal addition to the church, it must ever be regretted that it should have involved the demolition of the original St. Mary's Chapel, a work of the golden age, and, beyond all doubt, a piece of more genuine art and true magnificence than this mausoleum; which might have been built elsewhere; and whose beauty cannot here atone for the mutilation and patching of an otherwise almost matchless and seamless temple.

Descending the steps from Henry VII.'s Chapel, we have the best accessible view of the tomb of Henry V., which stands in a dark situation under the fretted vaulting that supports his chantry loft. It is more rich than elegant, and has his headless effigy in oak, which was covered with silver, the head being of massive silver, all which was stolen soon after the Reformation. On the north and south faces of the loft are rows of portrait figures, it is uncertain of whom; and over the apex of the arch, in each front, are groups representing his two coronations; that in England on the north side, and that in France on the south. The badges, repeated in great variety, are the swan, antelope, and burning cresset; the latter adopted by this famous prince "by reason of his dissolute life in the tyme of his father's raigne; shewinge thereby that although his virtuous and good parts had been formerly obscured, and lay as a dead cole, wanting light to kindle it, by reason of tender yeares and evell company; that, notwithstanding, he beinge now come to his perfecter yeares and riper understandinge, had shaken off his evell counsellors, and beinge now in his high imperial throne, that his vertues, which before had layne dead, should now, by his righteous raigne, shyne as the light of Crescet, which is no ordinary light; meaninge also that he should be a light and guide to his people to follow him in all vertue and honnor."

The next apsis, proceeding northward, was called *St. Paul's Chapel.* Its oldest tomb, forming part of the screen, commemorates Lord Bourchier, standard-bearer of Henry V. at Agincourt. Within, near the centre, stands another, with effigies of Sir Giles Daubeny and his wife, 1500–1507. All the others are modern and of little interest, except the statue to James Watt, the improver of the steam-engine, by Chantrey—the inscription by Lord Brougham.

Coming out of this, we have in front the nobly simple tomb of Queen Eleanor, which (except the effigy) is here best seen. Next to it, on the right, that of Henry III., with its Italian work in variegated materials and mosaic; and beyond, in the next intercolumn, the nearly obliterated words "PACTUM SERVA" mark the plain slab tomb of his son, one of the most glorious of our monarchs; by the side of which we ascend a narrow stair to the raised floor within the columns of the main apsis or horse-shoe, the sanctum of the whole abbey, the venerable nucleus of the present fabric, St Edward's Chapel, or, as it is now better called, the Chapel of the Kings. Though despoiled of all its marketable riches, and battered by civil war, this inclosure retains the unique excellence of being desecrated by no modern additions. In the centre stands the deserted wreck of the once gorgeous shrine of Edward the Confessor. Here his adorer, Henry III., having procured his canonization and carried on the rebuilding of this beauteous temple throughout his long reign of more than half a century, and having been just permitted to see the restoration of order, after years of anarchy, on the 3rd of the Ides of October, 1269, stooped, with his brother the King of the Romans, to bear on their aged shoulders, assisted by his sons Edward (afterwards king) and Edmund Crouchback, and as many nobles as could get near enough to touch it, the exhumed coffin of the royal saint, and place it in a jewelled chest of gold on the top of this shrine. Here have the prayer and chant and incense ascended, and to this have the eyes of pilgrim crowds been directed, day by day, for very many generations; and here has the spider spun undisturbed for many more. Here Cromwell's soldiers held their revels, and committed the most wanton profanities; and from hence, as late as the last century, have the very dust and cobwebs been carried to Spain and Portugal, to help immortal beings on their way to heaven.

The pavement was of the minute and precious mosaic called Alexandrine work, but enough does not remain to decipher the design. The screen dividing the chapel from the choir exhibits, besides its elaborate canopy work (probably of the age of Henry VI.), a deeply-carved frieze along the top, of fourteen subjects from the history of St. Edward, separated by a winding riband, on which their legends were inscribed. They represent, beginning from the south end:—1. The Barons, Spiritual and Temporal, swearing fealty to him in his mother's womb. 2. His birth. 3. His coronation. 4. His alarm at the apparition of the Devil dancing on the money collected for Dane-gelt. 5. His generous admonition to a thief whom he discovered robbing his treasury. 6. An apparition of our Saviour to him and others, while partaking of the Eucharist, in this church. 7. His prophetic vision of the drowning of the King of Denmark. 8. His prophetic denunciation of Earl Godwin's sons, when they quarrelled at his table. 9. His vision of "Seven Sleepers" in a cave at Ephesus, in consequence of which an embassy was sent to Constantinople, and a search instituted by the Emperor, which, we are told, led to the discovery of this prodigy. 10. His vision of St. John disguised as a pilgrim, to whom (having emptied his purse in almsgiving) he gave his royal ring. 11. The restoration of two blind men to sight, by washing in the same water that had been used by the King. 12. The apparition of St. John to two English pilgrims in Palestine, by whom he sends the king a message concerning his death, and returns the ring as a token. 13. The pilgrims delivering their message. 14. Edward's consequent haste to complete the rebuilding of this abbey.

Against this screen stand the coronation chairs; that of the Sovereign dating from the thirteenth century, that of the Queen Consort from the coronation of William and Mary. In the former (now retaining hardly a vestage of its once elaborate decorations in gilding and enamel) is inclosed, under the seat, the black stone of Scone, the Scottish Palladium, on which, from immemorial tradition, the rude chieftains of North Britain had been crowned; and in this seat have all our monarchs, from the great Edward I. down to her present Majesty (with the sole exception of the murdered infant, Edward V.), in the centre of this church, with all the solemnity that religious rites can afford, plighted their vows to the nation, and received the allegiance of England and Scotland.

Between the pillars inclosing this semi-oval chapel stand the seven royal tombs, which we have already seen from the surrounding aisle, except the effigies on them, which we can now examine. The first in time is the second from the corner at which we entered, the tomb prepared for himself by the builder of this pile, the weak but pious Henry III., the greatest patron of the Church, of priests, and of artists, that England has seen. The workmanship is Italian, like that of St. Edward's shrine, and the materials very various. The effigy, of brass or copper, thickly gilt, but now more thickly coated with dust, is also by an Italian, the first metal figure cast in England, and has much dignity, but lies too high to be well seen.

The next tomb, to the right, is that of Eleanor of Castile, the renowned Queen of Edward I., to whom, as the pattern of conjugal virtues, he also erected a lofty monumental cross of the finest architecture, at each place where the body rested in its twelve days' journey*. The tomb is every way worthy of its subject, the effigy (of brass) being, for simple dignity and benevolence of expression, decidedly the finest in England. The shields on the sides of the tomb are those of England and Castile.

On the other side of Henry III.'s tomb, close to the steps by which we entered, a plain pile of five slabs covers that monarch's famous son and successor, whose epitaph is simple and striking—

EDWARDUS PRIMUS, SCOTORUM MALLEUS, HIC EST, MCCCVIII.

and on the north side, facing Scotland,

PACTUM SERVA.

It having appeared that the remains of this prince were preserved by some kind of wax covering, formerly renewed periodically, the tomb was opened in 1774, and the body of the renowned Longshanks discovered in a remarkably perfect state, wrapped in thickly-waxed linen, and from the waist downward in figured cloth of gold. He measures 6 ft. 2 in., and has on the head a crown, and in each hand a finely and curiously-wrought sceptre, reaching to the shoulder, one terminating in a cross, the other in a dove. These are of copper, and the crown of tin.

In the south-eastern intercolumn, corresponding to Queen Eleanor's tomb in the north-eastern, is that of Queen Philippa, consort of Edward III., whose own tomb follows next, in the middle of the south side. We have elsewhere observed ("Architecture," pp. 150, 151), how both these monuments afford proof of the national taste and skill in arts having, during this long reign, not only attained their climax, but *passed* it, and begun to evince that fatal tendency to estimate works of ornament by their amount of manual labour, which (together with their perversion from the service of religion and the public good to that of private vanity) brought us at length to value them mainly as indications of wealth; hence to the "civilized" (?) want of counterfeiting them; to the entire confusion in the popular mind of counterfeits with realities; hence to the mechanical multiplication of ornamental forms (as if 100 repetitions of a form, upon one thing, all mechanically reproduced, contained any more ornament than a single one); hence to the perversion of machinery—from a supplier of force that the artizan directs, to a director of that which he supplies; and thus, to the reduction of the people to machines, power-engines, vainly struggling to compete against steam and iron. The completion of these changes now precludes all hope of our works again being graced with marks of genuine wide-spread refinement and real splendour, such as pervade and distinguish all those preserved from that brilliant age of our history comprised in the reigns of the three Edward Plantagenets*. We may admire and *counterfeit*, but cannot *imitate* the marks of a civilization so far above ours. As the direction of the wind is known by a feather, so are the tendencies of a society to civilization or to decivilization written, if we could but read them, in the most trifling works of luxury, even the ornaments of a tomb.

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* Namely, at Lincoln, Grantham, Stamford, *Geddington*, *Northampton*, Stony Stratford, Dunstable, St. Albans, *Waltham*, and Charing (as some say, *chère reine*) Cross. Of these, only three (in italics) now stand. The rest have mostly been appropriated by the savagery of a later age *to mend its roads!* What Vandals never did in Italy, nor Turks in Greece, Britons have done in their fatherland.

Next to Edward III.'s tomb, westward, is that of his son Richard, the last of the direct Plantagenet line, an over-enriched work, contrasting as strongly with the opposite plain slab of Edward I., as the actions of this luxurious and feeble prince with those of the "British Justinian." The tomb was prepared by Richard, on the death of his queen, Anne of Bohemia, in 1394, and the effigies of brass were specially directed to have the right hands clasped, which have now disappeared. Though dying a prisoner, soon after his deposition his body was brought and laid here in 1400.

Near the steps by which we entered, a slab is inlaid with the brass portrait of this monarch's treasurer and favourite, John de Waltham, twenty-sixth Bishop of Salisbury, the only person not royal who has been honoured with a grave in this chapel. Another stone near Queen Philippa *was* inlaid, but retains only the indent of a similar memorial to Thomas of Woodstock, brother of Richard II., and, as some say, murdered by his order.

Lastly, occupying the middle eastern arch of the apsis, not "shouldering God's altar," but actually *replacing* it, we find the gorgeous façade of Henry V.'s monument, the sides of which we previously saw from below. It is singularly appropriate to this last flower of English chivalry; the requirement of a gallery above, and the two stair turrets, enabling the ingenious artist to imitate, in the general form, at once the initial H and the effect of a castle gateway, the warlike character of which is refined but not destroyed by the minute enrichments. Henry left instructions for this singular arrangement, a "*locum excelsum*," over his remains, with stairs for ascent at one end of the tomb, and for descent at the other end; whence it is plain (the present turrets being at the *sides* not the *ends* of the tomb) that he neither commenced it himself (indeed the style of vaulting is later than was invented in his reign), nor had the vainglory to select a central and pre-eminent spot, such as none of his predecessors had presumed to occupy with their own tombs—a piece of profanity which was left for Henry VII. in his chapel. This selection is due to the enthusiastic adoration with which his survivors mourned the young hero so prematurely lost. On a bar of wood between the turrets still hang (strange ornaments in a church) the bruised shield, saddle, and helmet—one of

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* That the general intellectual refinement then attained was not confined to what are called ornamental arts may be illustrated by this remark of Sir Matthew Hale, that "under the reign of Edward III. the law was improved to its greatest height. The judges and pleaders were very learned. The pleadings are more polished than those in the time of Edward II., yet they have neither uncertainty, prolixity, nor obscurity; so that, at the latter period of this king's reign, the law seems to have been near its meridian." With our own language yet in formation and unsettled, of course there could be no literature; but in all else the culture of the nation had then reached its climax. Mind had attained the greatest preponderance over matter that it ever has done in England.

> . . . . "the very casques,
> That did affright the air at Agincourt."

The funeral of this prince must have been one of the most sumptuous ever known. Nearly a thousand torch-bearers, in white, accompanied it from Paris to Calais, by a long détour through Normandy; and the train, even before crossing to our shores in several ships, extended a league, with numerous ecclesiastics chanting the services all the way, day and night, and masses in every church where the body rested. Splendid obsequies were performed in the cathedrals of Paris, Rouen, Canterbury, and London, and at the two former, the citizens (anticipating that we should get him canonized) offered large sums to have him buried among them, which they would only have thrown away, for the honour and profit of a new saint was not obtained even for Westminster; the papal policy, to multiply impediments and expenses in proportion to the wealth of the saint-seekers, having in this case reckoned on more perseverance than we possessed. Still, it is plain that the shrine of the fanatic St. Edward, whose posthumous popularity was more due to Norman tyranny than to anything of his own, was grown old-fashioned, and that the Fifth Harry's was meant to supersede it. Indeed, his son, when grown up, intended to rebuild the whole abbey in honour of him, had not the war of succession intervened; and this design supplies a link otherwise unaccountably missing in the series of foundations, actual or intended, which so plainly marks the natural course of corruption in worship:—Sebert builds to his Saviour—Edward to his favourite Apostle—Henry III. to his favourite predecessor—Henry VI. to his father—Henry VII. to himself.

Descending from the Chapel of Kings, we are conducted to the last subordinate apsis, called *St. Erasmus' Chapel.* It contains the ancient tombs of Hugh and Mary de Bohun, grand-children of Edward I., a slab only; William of Colchester, Abbot of Westminster, *d.* 1420; Sir Thomas Vaughan, Treasurer to Edward IV.; Bishop Myllyng, also Abbot here, *d.* 1492; Abbot Fascet, *d.* 1500; and Bishop Ruthall, Secretary of State, *d.* 1524. The florid Elizabethan monument to a Lord Hunsdon, *d.* 1596, is also curious; and the tomb in the centre, to Cecil, Earl of Exeter, *d.* 1622, and one of his wives *d.* 1608, with the vacant space for the other, *d.* 1663, who refused to occupy the left side.

The next chapel, formerly St. John Baptist's, a square compartment corresponding to what we first entered, is occupied by the chantry of Abbot Islip, *d.* 1510; and, being dark and containing no remarkable monument, is not shown. Its architecture, however, is rich and elegant.

The present chancel, between the crossing of the transept and the screen of St. Edward's Chapel, is flanked and divided from the aisles by ancient monuments, of which the three on the north side are singularly fine. The largest, next the altar, is to Edmund Crouchback, brother of Edward I., and ancestor of the Lancaster line; the next, to Aymer de Valence, *d.* 1324, son of William de Valence (whose tomb we saw in the first chapel), and grandson of King John; the third, and smallest, to Aveline, wife of Crouchback. This last, which has one side blocked up by modern barbarism, is the oldest *Gothic* monument in the abbey (those of St. Edward and Henry III. being Byzantine). Of the monuments of Aymer and Crouchback (which are visible from the aisle as well as the chancel), Flaxman says, "the loftiness of the work, the number of arches and pinnacles, the lightness of the spires, the richness and profusion of foliage, the solemn repose of the principal statue, the delicacy of thought in the group of angels bearing the soul, and the tender sentiment of concern variously expressed in the relations ranged in order round the basement, forcibly arrest the attention, and carry the thoughts not only to other ages but to other states of existence." English monumental art may indeed be said to have culminated about the time that these memorials were erected. Some of the same age, or a little earlier, in Salisbury and York Cathedrals, are equally fine.

In the north aisle, not far from the back of Aymer's tomb and the entrance to Islyp's chantry, is a slab inlaid with the fine brass portrait of Abbot Esteney, or Eastney, *d.* 1498; one of the best remaining here, many having been stolen for the value of the metal.

Of the two tombs occupying the intercolumns south of the chancel, that with a wooden superstructure in four gabled compartments, covers the bones of the venerable Sebert, first founder of the Abbey, which, after being buried 700 years, were exhumed and brought here, in 1308, by the monks. It was gorgeously painted and gilt, and is remarkable for retaining traces of *oil painting*, perhaps the earliest in existence, and disproving the common tradition that Van Eyck invented that process. The four main panels were thinly plastered and then painted, each with a single human figure, both on the front under the canopies, and on the back towards the south aisle. In the front, the first niche from the east contained the figure of Sebert, the second of Bishop Mellitus, the third that of Henry III., and the fourth it is not known whom, this panel, as well as that of Mellitus, being now quite defaced; but some traces of Sebert and Henry may still be distinguished, as well as decorations of foliage, &c., on the groining. The back, towards the aisle, is said to have exhibited Sebert, St. Peter, Edward the Confessor, and St. John; but only the figure of Edward can be traced, presenting his ring to St. John, according to the legend. The whole has been defaced with planes and other tools, in Cromwell's time. The tomb or sarcophagus itself, in an ornamented recess, is now hidden by a framed and glazed specimen of painting from some other part of the church.

The other monument, in the barbarous semi-Italian style of Henry VIII.'s time, covers Anne of Cleves, his divorced Queen, *d.* 1557.

In the centre of the chancel is a large square of Alexandrine pavement, coeval with the building, and far more perfect than that in Edward's Chapel, though it has lost all the brass letters of its inscriptions, and many thousand of its almost innumerable tesseræ of porphyry, jasper, lapis lazuli, touchstone, and various marbles. The interlacing circles contained many lines of Leonine verse, very obscure, relating, it is thought, to the Ptolemaic system of the world, as the line surrounding the central ring is—

> "Sphœricus archetypum globus hic monstrat microcosmum."

The four verses running along the outer border import that the work was performed in 1268, with materials brought from Rome, at the expense of Henry III., by one Odoric, the King, and the Abbot. It has hence been called "Abbot Ware's pavement," but, whether his idea or not, it certainly was a very fine one, worthy the designer of a grand monumental edifice, thus to register its date by an elaborate work at once decorative and expressing the latest cosmographical science of the day. Instead of the trash, pieces of money, &c., now buried under foundation stones, professedly with a similar object, how variously and how nobly might this idea of the Westminster architect, which that age could so inadequately carry out, be adopted in later times, if they ever built in the spirit that dictated this glorious pile—built for the future as well as the present. How fitly might some "microcosmum" distinguishing the stage then reached by human knowledge (not, as here, speculation, but positive knowledge, and particularly in geography, or uranography, in which there can be no halting or retrogression)—how fitly might such embodiments of our latest science, more complete and condensed and highly finished than is possible in works multiplied by printing or cognate arts, at once decorate and usefully enrich the monuments containing them, mark their precise age, commemorate and possibly preserve discoveries, and set up landmarks of the advance of mind. The riddling inscriptions on this "microcosm" pavement (mere monkish speculative trifling) seem to have diverted attention from the beauty and fitness of the general aim.

The last enclosure to which visitors are conducted is the east aisle of the north transept, formerly divided by screens into the three chapels of St. John the Evangelist, St. Michael, and St. Andrew; and still enclosed and almost blocked up by contending heaps of sculptured marble, all bearing witness to the vulgar ostentation or savage gratitude of modern times. The extreme unfitness of these monuments to any temple, and still more to the beauteous one they incumber, is made, if possible, the more painful, because more irremediable, by the excellence of the sculpture of some of them; two of those in this aisle being among the finest in the church—or rather the museum, that so disgustingly desecrates the church: one is by Roubiliac, to a Mr. and Mrs. Nightingale, *d.* 1734–1752. The lady is represented dying in the arms of her husband, who endeavours to ward off the dart cast by Death issuing from a cave below. The whole would be well fitted to Madam Tussaud's "Chamber of Horrors," combining that high finish and exactness of corporeal imitation, and that frightful grossness and matter-of-fact, peculiar to the tastes of a late—very late—stage of civilization. The other celebrated monument is to Sir Francis Vere, *d.* 1608. The four kneeling knights supporting the slab are very life-like. Among the other memorials are two mere tablets to the philosophers Dr. Thomas Young, and Sir Humphrey Davy, *d.* 1829; and a statue by Baily, R.A., to Telford, the introducer of suspension bridges, *d.* 1834.

The remaining parts of the church, over which the visitor is allowed to proceed alone, contain, like this last, only modern monuments. In the north transept, almost given up to them, will be observed the grave-stones, near each other, of the great rivals Pitt and Fox, and a monument to the latter (*d.* 1806), by Westmacott. A statue of Canning (*d.* 1827), by Chantrey. Immense marble advertisement of a Duke and Duchess of Newcastle, of Charles II.'s time. Beyond it, and also occupying an entire arch of the east aisle, a similar pyramid of triumph to their son (*d.* 1711), by Bird. Next to it, against the north end wall, Admiral Vernon (*d.* 1762), by Rysbach. Filling the arch of the west aisle, opposite the second Newcastle monument, that to the great Earl of Chatham (*d.* 1778), by Bacon; a national tribute. Filling the next arch, another public monument to three officers under Rodney, 1782. Occupying the next, Chief Justice Mansfield (*d.* 1793), by Flaxman. In the west aisle, behind these colossal displays, an uninscribed statue, designed by Flaxman, of Kemble the actor, in the character of Cato, (*d.* 1823). Bust to Warren Hastings (*d.* 1818), by Bacon, jun. Monument, at the end, to Lord Halifax (*d.* 1771), by Bacon; and a great number of others.

It seems impossible to turn from this transept and its unparalleled sculptural display without a very humiliating sense of the contrast presented to the ancient monuments we previously saw. Even shutting our eyes to the more odious characteristics of the modern show, as a whole—the selfish disregard and ruthless destruction of our fathers' beauteous work and its decorations (far more elaborate than what replaces them)—the deliberate sacrifice of its space, its grandeur, its completeness, and their elaborate thought and handiwork, all devoted to God's glory, wherever it was supposed to stand in the way of man's—the treatment of the glorious fane left by their piety, as simply the largest ready-made shelter, conveniently near at hand, adaptable to our purpose—even shutting our eyes to all this, the general impression conveyed by this Pantheon is one in which disgust must, we think, predominate. The *tout ensemble* is, at the very best, that of an advertising van; the expression that of a desperate scramble for individual display—a total absence, not only of general plan, but of any community of aim—a total sacrifice of the great to the little—of all other objects to the narrowest one, the self-display of each monument. They seem ready to dispute for pre-eminence till they consume each other, like Earl Godwin's sons. All this may be characteristic, beautiful, and *true to life*, but does that render it more consistent among the *dead?* May it not here be *too* life-like? and is not this scuffle within the temple unseemly for its very truthfulness to the world without? How different the general impression of the old monuments. They, too, are true to the external world, but it is the natural instead of the artificial world. They, with all their elaboration, seem to scorn display; to be made not to show themselves, but to be sought out. Like flowers in the valley, or stars, they seem without rivalry, though differing one from another in glory; while the modern are like nothing in nature—like rival suns disputing the empire of the temple above.

Again, how regularly has the thought contained in these works become more and more diluted. The ancient sculptor seems not to have thought it worth while to take up more space, or use more material than he could fill throughout, in every corner, with fine or curious thoughts and ideas, decorative, sculptural, or even poetical; and this without detracting from the unity of the whole. But the modern, under pretence of this unity, leaves all these subordinate parts mere specimens either of his technical dexterity or of neat mason's work. Such an amount of thought as our fathers considered only sufficient to nestle in a capital or a boss, or be packed into a spandril, we think worth filling an aisle with a heap of marble and years of human labour.

Considering the contrast between the *means* of the ancient and modern monument makers; considering what they did with a little coarse stone—with mechanical appliances and skill that we call barbarous, and tied down by the strictest subordination of their works to the great monument that shelters them, and sacrifice of their display (as parts) to the whole—and what our artists do, with their tons of marble and thousands of money—with the utmost mechanical refinements and technic skill, and with Heaven's temple freely surrendered to their pleasure, to batter, deface, defile, and block up, as they dare not an exhibition or a bazaar,—the wonderful success of the former, compared with the latter, is the more remarkable.

Passing by the north aisle of the choir, towards the nave, we may notice the tablets to three musical composers:—Purcell, *d.* 1695; Dr. Blow, 1708; and Dr. Arnold, 1802; the inscription on the first by Dryden. Also statues to Sir G. L. Staunton (*d.* 1801); and Sir Stamford Raffles (*d.* 1826), by Chantrey; and one to Wilberforce (*d.* 1833), by Joseph.

In the north aisle of the nave, third window, Spencer Percival, shot in the House of Commons, 1812, a public monument by Westmacott; fifth window, Robert Killigrew, killed at Atmanza, 1707, a monument in one stone, by Bird. Before this is the little square stone of Ben Jonson, who was buried upright. The original stone, with the inscription "O rare Ben Jonson!" done "at the charge of Jack Young, who, walking here when the grave was covering, gave the fellow eighteen pence to cut it," was removed, and a copy (with his name mis-spelt) placed in Poets' Corner; where it has been the only form of epitaph in this church thought worthy of repetition, a neighbouring grave displaying "O rare Sir William Davenant." Seventh window, Major-General Laurence (*d.* 1775), by Tyler, at the charge of the East India Company, which is personified by the principal figure pointing to his bust. At the end, Captain Montague, killed in Lord Howe's fleet, 1794; a public monument, by Flaxman.

Over the west entrance, William Pitt, by Westmacott; a public monument. On the south side, opposite Captain Montague, Captain Cornewall, *d.* 1743; the first public monument erected. The end compartments of each aisle, under the towers, are blocked up by similar erections.

In the south aisle, at its end, under the tower arch, Secretary Craggs (*d.* 1720), by Guelphi. Under the first window, Congreve, the comedian (*d.* 1728), by Bird, at the expense of a Duchess of Marlborough. Second window, Bishop Spratt the poet, and his son (*d.* 1713–1720), by Bird. The apotheosis above, well named the "pancake monument," will, it is to be hoped, not always disgrace the name and nation of Admiral Tyrrell. Fourth window, Field Marshal Wade (*d.* 1748), by Roubiliac. Fifth window, the wives of Sir Samuel Morland (*d.* 1674–80), whose epitaphs are among those which the *Spectator* remarked were so modest as to conceal their praises in languages not understood once a twelvemonth—one in this case, Ethiopic. General Fleming (*d.* 1750), by Roubiliac. Sixth window, Sir William Temple, the statesman of Charles II.'s time, and his family, erected pursuant to his will. Sidney, Earl Godolphin (*d.* 1712), by Bird. General Hargrave (*d.* 1748), an elaborate composition, by Roubiliac. Seventh window, Sir Palmes Fairholme, shot at Tangier, 1680; the epitaph by Dryden. Major André, executed by the Americans, as a spy, 1780; by Van Gelder, at the expense of George III.

Against the choir screen, on the north of the entrance, Sir Isaac Newton, by Rysbach, a monument which, containing more real elaboration and meaning than most of the modern, may be said to be, comparatively with them, worthy of the man, though not of the place. Some shameful injury has been inflicted by relic hunters, but *not repaired*, as Major André's memorial has been *several times.* On the other side, the first three Earls Stanhope (*d.* 1720–54–86), by Rysbach.

In the south aisle, continuing towards the transept, Thomas Thyme, mysteriously murdered in Pall Mall, 1682, by Quellin. Dr. Watts, the poet and divine (*d.* 1748), by Banks. Pasquale de Paoli (*d.* 1807), by Flaxman. Sir Cloudesley Shovell (*d.* 1707), by Bird; one of the absurd monuments mentioned by Addison, in the *Spectator.* Sir Thomas Richardson, the Chief Justice (*d.* 1634), a bust by Le Sueur, much admired. William Thyme (*d.* 1584); the first monument erected west of the transept.

The south transept, or more properly, its south-eastern part, is known as "Poets' Corner," from containing memorials to nearly all our poets, whether buried in this church or elsewhere. In interest, this part of the fabric is equal, or second only to St. Edward's Chapel, to which it also presents the most direct antithesis in point of beauty and taste; all the interest of that spot being confined to its artistic monuments—all the interest of this to its epitaphs.

Chaucer, the father of English poetry (*d.* 1400), is commemorated by a tomb erected over his grave, in 1555, by a private individual. It is under the middle window of the east aisle, in a place exactly corresponding to that of Gower, in St. Saviour's, Southwark. Spenser (*d.* 1598), has a monument standing centrally in the end of the aisle, a copy in marble, of the original, which had fallen to decay. Michael Drayton, poet and antiquary, contemporary with Shakspere (*d.* 1631), has an epitaph by Ben Jonson, much admired, on the left of the little entrance door. A statue of Shakspeare (*d.* 1616), by Scheemaker, stands facing the main transept, under the last aisle arch, which is walled up. The remains of the immortal bard would have been brought from Stratford, but for the solemn request left on his grave:—

> "Kind friend, for Jesus' sake forbeare
> To dig the dust inclosed heare."

This memorial was erected in the time of George II., as were also those to Ben Jonson (*d.* 1637) and Milton (*d.* 1674), both in the corner, adjoining Spenser's. They were carved by Rysbach, and the inscriptions are those alluded to in the *Dunciad:*

> "On poets' tombs see Benson's titles writ."

To the left of Chaucer's tomb, Cowley (*d.* 1667), the epitaph by Sprat. Exactly opposite to this, Thomas Triplett (*d.* 1670). In the corner, near Milton's bust, one to his contemporary, Butler, the author of *Hudibras* (*d.* 1680). Near this also, Thomas Shadwell (*d.* 1692), Poet Laureate to William III.* Under the window next to St. Benedict's Chapel, Dryden (*d.* 1700); the bust by Scheemaker. To the right of Chaucer, John Phillips (*d.* 1708); the epitaph, by Atterbury, was at first refused admission because it contained the name of Milton, which was thought a pollution to the walls: this was some twenty years before the erection of Milton's memorial. At the transept end, beyond Shakspere's statue, Nicholas Rowe (*d.* 1718), tragedian, and Poet Laureate to George I., by Rysbach, the epitaph by Pope. Against the last pillar on the west side, Addison (*d.* 1719), who was buried in Henry VII.'s Chapel. This statue by Westmacott was not erected till ninety years after the death of the guileless satirist. Against the screen, behind Shakspere, facing the entrance, Prior (*d.* 1721), a monument erected by himself, or in pursuance of his will. In the main transept end, a medallion of Gay, *d.* 1732, by Rysbach; the epitaph partly by himself (in questionable taste), the latter part by Pope. In the corner, next to Shakspere, Thomson, the poet of the *Seasons* (*d.* 1748), by Spang. In the end of the aisle, to the right of Spenser and under Milton, Gray, the elegist (*d.* 1771), by Bacon; the epitaph by Mason. At the end of the main transept, in a recess, Goldsmith (*d.* 1774), by Nollekens; the epitaph by Dr. Johnson, who could not "disgrace the walls of Westminster Abbey" with an English one. To the back of the screen, towards the little entrance, Mason (*d.* 1797), by Bacon; the epitaph by Bishop Hurd. Against the south-east pillar, Christopher Anstey, humourist (*d.* 1805). Robert Southey, late Poet Laureate (*d.* 1843), by Weekes.

In the floor, among the gravestones, are those of Campbell, author of the *Pleasures of Hope;* Dr. Johnson, lexicographer, &c.; Garrick, actor; Sheridan, dramatist, &c.; Macpherson, author of *Ossian;* and William Gifford, critic. Also, near the centre, the patriarch Old Parr, who was born in the Middle Ages (under Edward IV.), and died in modern times (1635), aged 152, having lived in ten reigns.

Among the monuments to eminent persons not poets, Camden, the antiquary (*d.* 1623), at the corner next the nave, against the wall of that part of the cloister which projects into the church. In the same compartment, Casaubon (*d.* 1614), and Grabe (*d.* 1711), both eminent scholars. Grabe, not the happiest figure in the exhibition, is unfortunately conspicuous; and Garrick by his side, unveiling Shakspere, does not improve the effect. On the same wall, further south, Dr. Isaac Barrow, theologian, chaplain to Charles II. (*d.* 1677). Dr. Hales, theologian and physicist, who introduced artificial ventilation (*d.* 1761). Handel, musical composer (*d.* 1759), by Roubiliac. In the end wall, the great Duke of Argyle (*d.* 1743), by Roubiliac, one of his most famous works. The figure of Eloquence was much admired by Canova. Towards St. Benedict's Chapel (where we started), Dr. South, eminent divine (*d.* 1716), by Bird. Dr. Busby, the most famous master of Westminster School (*d.* 1695), by the same.

The glass paintings were anciently among the most interesting monuments of a great church, for that admirable method and longsighted care which distinguishes early monastic art seems to have appropriated the windows to the honorary memorials of persons *not buried* in the building, the only sculptural monuments to individuals being strictly *tombs*. Of these fragile but imperishable paintings (which, while defying time and natural agents, trusted—alas! too confidently—to the continuity of human progress), fanaticism and wantonness have here left but very imperfect remains, in five only of the windows—the three of the apsis over St. Edward's Chapel, and two at the west ends of the side aisles. The former are coeval with the building, and represent, in one window, our Saviour and the Virgin Mary; in another, St. Augustine the Missionary (*d.* 611) and Bishop Mellitus (*d.* 624); in a third, Edward the Confessor giving his ring to the Pilgrim, according to the legend abovementioned. The other two small windows, in the west towers, represent an Ecclesiastic, unknown, and Edward the Black Prince (*d.* 1376).

The great west window, and that of the north transept, were executed early in the last century; a time, of all others, the most strictly intermediate between the fall, or so called "loss" of this art, and its pretended revival. Whence their technical completeness? Was the art not yet "lost," or had it begun to be recovered? Why, they simply prove the whole story of lost secrets a miserable fiction. Nothing has been lost (or nothing worth recovering) in the mere externals of the craft—its manipulation, its teachable things, its *lex scripta*. What *has* been lost is precisely neither more nor less than has been lost in all other arts—no part of the art itself, but the end to which it is directed, the spirit in which it (in common with all others) was carried on;—the spirit of an age of unsophisticated honesty—of an age that built, carved, painted, did all, as unto more than men—of one that had not yet heard of "*effect*," in our sense of the word; that for our word "*effect*," read *excellence;* and for our *cheapness*, nature-like *economy*. *That* is what is lost; not the way to make red glass, or this, or that preparation, process, or rule. *This* is what is lost, not in one but in all arts alike, and all over Christendom, but most completely in England; and neither science nor skill can recover it.

The north window, executed in 1722, represents in its sixteen parts, our Saviour and the Eleven standing, and the Evangelists recumbent. The west window, put up when the front was finished, in 1735, has in the top row, Abraham, Isaac, and Jacob; in the next, seven of Jacob's sons; in the lowest, five more, Moses, and Aaron. It will be observed that these subjects are so chosen as to admit of the names being mostly interchangeable. The patriarchs would have served just as well for apostles, or *vice versâ;* the primary, or rather sole end being *ornament;* and the semblance of *meaning* being only *nominally* retained in conformity to antiquated prejudices, but plainly regarded as an embarrassing clog, to be as nearly shaken off as possible. Otherwise, the difference from older works consists mainly (as in the sculptural monuments) in the dilution of thought—the spreading a very little over a vast surface; indeed, husbanding and making it go as far as possible; and the making external qualities and *effects* serve in its stead—the sensuous instead of the intellectual. All this, we must remember, like everything in the history of art, is characteristic, not of the *artist*, but of the *age* for which he works.

Of the south transept windows and their sham antiques, we would gladly say nothing; but there is in this last refuge of our arts,—this attempt to reproduce an effect without its cause, by simply exaggerating the *defects* of our fathers' works, by throwing away all advantages that they *had not*, instead of acquiring what they *had*,—thus wilfully combining all their works' unavoidable defects and all our own, with the merits of neither;—there is something in this so dismally pitiful, that even the open surrender of mind to matter, as in the monstrosities of modern engineering, seems less humiliating. One would think it should be disgrace enough to record in monuments what we *must perforce* show, viz., how much we have lost; without going out of our way to make it appear (falsely), that we have in six centuries gained nothing—no better materials from all our chemistry—no larger pieces from all our manufacturing pretension—no less clumsy construction from all our boasted mechanics—no finer workmanship from all our refinement—no more graceful design from all the opened stores of Greece and Italy—no richer variety from all our laboured collection of the brainwork of every other age and clime; in a word, that six centuries have passed away to leave us not only *minus* the principal thing, but *plus* nothing.

On comparing these monuments of the incredible power of fashion with the north and west windows, it will be observed that even the purely *physical* and *sensuous* requirements of harmony and balance of colours are *now* too much to expect. In the Georgian windows (as in mediæval ones), colours are so arranged that no two which are discordant come together, and so apportioned as for the whole of any one window to balance, or, when optically combined, produce neutrality; but in the Victorian ones, so "practical" are we become, even these things are more than we can or will do, though they are now mere matters of rule, to be done almost by the blind, while our fathers had no guide but the delicate perception unimpaired by separation from nature. Paradoxical as it may seem, it is literally true, that before optical laws of colouring were *known*, they were nearly always *practised*, and since they have been known, hardly ever.

When the present heartless fashion of caricaturing our ancestors over their very graves shall have run its course—when this insult to common sense and right feeling shall have got its requisite length of rope (a consummation that cannot surely now be far distant, for it has been lengthening many years)—then, but on no account *till* then—if we might indulge in a hope for common sense either to *let alone* the decoration of Heaven's temple and commemoration of our worthies, or else to devote to them the best of our science, the best of our manufactures, the best of our ingenuity, study, taste, and judgment—there would seem no reason why any of the Abbey windows should remain glazed like those of a stable. Not only does sacred story afford subjects enough for more than fancy windows with scriptural names, but the series begun with Augustin and Mellitus might be fitly continued by memorials to eminent English divines, at least, if not lay characters. As such memorial paintings were gradually substituted for the present monuments, they might be successively removed; the private ones to be delivered to the representatives of the families who erected them, and the public ones (that we might not add to a disgraceful record the disgrace of suppressing it) to be arranged as curiosities, in chronological order, in some convenient place, such as Westminster Hall, whose plain walling, 600 feet in length by 22 high, would afford ample room for them. If the beautiful wall-arcades, or stone stall-work were then restored, as to mouldings, but with no new carving (for we have no right to palm off *our* designs as parts of the building; that is *forgery*), each archlet would afford space for two or three sculptural memorials immovably confined like the metopes of the Parthenon; and though we could not insure good taste in these insertions *themselves*—for taste is a thing too subtle to be reached by restrictive laws, and *will* tell its tale in spite of all attempts at falsification—yet, by allowing no memorial to extend either in breadth or in projection beyond the inclosing recess, we should at least preserve the *tout ensemble* from any of the hideous disfigurement that has now given it the expression of a tradesmen's bazaar, by insuring the ancient and natural subordination of the parts to the whole. Monuments are *records* to be examined, not *advertisements* to scramble and be thrust at us. Moreover, a national building ought no longer to admit monuments of family vanity; and might further exclude all such niggardly barbarisms as the mere marble placards now becoming common, under a miserable perversion of the term "*simplicity*." If people think to honour the worthy dead by the "simplicity" of the smallest possible amount of thought by which an inscription can be displayed—if they can afford nothing better than neat masonry—they will find a proper place for such "simplicity" in a tubular bridge, and not in Westminster Abbey. We want no engineering here. It is contrary to all nature and reason that ornaments should be less elaborate than what they adorn—jewels cheaper than their casket. Supposing the wall-arcades restored as above suggested, no memorial should be placed in them without sculpture or foliage, or, at the very least, mouldings in curved and graceful forms.

Let us proceed to the exterior. It is now admirable only as a *whole*, the unfortunate selection of its original stone having led to the loss of all the details. What are called "restorations" have taken place at two periods, under Wren and quite recently; the former in undisguised rudeness, the latter in sham refinement. There is this further difference; that Wren's repairs (which are pretty equally spread over the whole) are simply and directly with the object to *preserve*—to keep the fabric together, by renewing only the things that absolutely required it for stability, and these mostly with as little work as possible. They can never be mistaken for parts of the original. The recent ones (which are chiefly confined to the north side of the nave, and east of the cloisters) are of a totally different kind, placing that object *last* which Wren placed *first*, and *vice versâ.* Their primary, if not sole end, is *appearance;* to renew a smart external surface, as much like the original as we can guess; so that (while availing ourselves of the ancient core) we may dress it so as to destroy or conceal all our fathers' work, and make the fabric appear *ours;* so as to silence the incessant clamour of those odious old stones, always looking down and taunting us with "you cannot do this!" The aim of the new kind of "restoration" is *appropriation.*

The two kinds of repair cannot be mistaken. They are distinguishable most easily by the order in which they are carried on. Thus, at the Temple Church (see pp. 136–139), if the object of the Templars, in 1840–5, had been of the former kind, they would, *before* painting and polishing, have either restored the pillars and vaulting to their designed position, or at least completed those provisions for its stability which the original architect had so happily contrived, but, for want of mathematics, could not exactly carry out; and they would, rather than break the integrity of the pile by throwing out an undesigned excrescence, have tolerated their organ anywhere (even where it had always been); for it has been well said of this kind of repair, "better a crutch than a broken limb." It is better to block up, hide, or disfigure to any extent, than destroy or mutilate. So also here, if the object of the Dean and Chapter had been now (as in Wren's time) the preservation of the treasure entrusted to them, we should, *before* seeing the wholly inessential outside tracery of the cloisters smartly and fancifully renewed, have seen their walls and vaulting restored to the stable form from which the removal of butments has caused them to swerve; and *before* seeing ornaments *added*, we should have seen the squalid erections over them *removed;* and the flying buttresses which are now (in the nave) the *only* parts unaffected by the dressing and ornamenting, would (as the most vital and exposed part of the structure) have been the *first* to receive repair and protection. In everything the nature of modern restoration is evident; it is not (like Wren's) to preserve a work of others' art, but to keep up appearances with the vulgar, and, as far as possible, appropriate its merit.

Besides the odiousness of the spirit displayed in such works, it has been well observed that they are an offence and injustice to universal humanity; that the beautiful works of another age do not belong to this (much less to those who may happen to have their guardianship); that every succeeding age has its right in them; that they are *not ours*, and we have *no right to touch them*. We have no right to stick up (as on the nave) our carvings, and our statues, and our designs, as parts of Westminster Abbey. If any people want a fancy abbey of their own, they are welcome; let them build it on their own ground, and let it be *all* their own, inside as well as out, structure as well as clothing. Let them scorn to do as the Templar lawyers; who, when they had a fancy to copy an old church (that of the Templar knights), *to save a rood of ground*, made the original a *palimpsest* for their copy. The Dean and Chapter have no right to do this. They have no more right to give posterity, as part of Westminster Abbey, that which is *not* part of it, than they have to perpetuate as part of the Bible or of Magna Charta that which is not so. They cannot do this, but they *can* do the former, unless the nation prevent them. Now the artistic works of all past times, besides being the records and charters of art (and those of the 13th century are among her *classics*), are also the truest records of humanity. To falsify or add to them is *forgery;* it is a *perpetuated lie*, and falsification of the world's knowledge. It is absurd to say, "we do not add *our* works—they are restorations, copies." Of what are they copies? If of what existed before, it need not have been renewed. But if not copied from this, they are ours, and a forgery. Every part of the original surface either remained or was gone. But where it remained, it needed no renovation; and where it was gone, how could we copy it? The work is ours, and a forgery. This is the case with every member and feature that is carved by hand. It is an unique; and has no right to be touched, unless necessary to be renewed for stability, and then only in a different (obviously different) material, and with a date: otherwise it is a forgery; it pretends, in the eyes of posterity, to be what it is not. Again, mouldings have no right to be swept off and renewed entirely (as at the Temple Church), leaving no specimen of the original to prove their authenticity. "Restorers" have no right to destroy the world's records (or their evidence) and oblige us to take *their* word only. *We* may have evidence that the church in Temple Lane is like that of the Templars; but what is the next generation to do? For them the church of the Templars exists no more. They have only an authorized copy. All, then, that remains lawful ground for unlimited "restoration," is *plain wall.* But this is just what no one *wants* restored, for taste. Who admires the new buttresses any more for their dapper faces? And as the old work is simply cut away, to hang on the reduced remnant an added burthen, any increase of stability from such casing is very problematical, except in so far as it protects from the atmosphere and further decay. This, doubtless, is proper; but then we have no business with the smooth faces and sharp angles. How do we know they were so originally? To make it appear that we know them to have been so is forgery. They may have had features we know nothing of, or may have been quite rough, as we ought to leave them—not to mimic age, but to show the true character of the work, and avoid misleading posterity. All that is spent on this outside smartness should have been bestowed *first* on closer fitting and more durable construction.

How humbling is the sight of the microscopic littlenesses now done to meet the demand for "*restorations*." We *cannot* (we the rich) proceed with a monument nineteen-twentieths or forty-nine fiftieths finished (as this or Ely Cathedral), and for want of the remainder, standing a fragment. We *cannot* (we the practical) clear what is blocked up by some hideous tumour of the last century's niggardliness or vanity. We *cannot* (we the engineers) straighten a few crippled pillars (as here and at Salisbury); far less (we the scientific) prevent their bending again, or make provisions and remedies against decrepitude of structure, that our unscientific ancestors had *almost* made. No, but we do what we *can*. We can renew stones whose edges are battered, with wonderful perfection; we can scrape this and colour that, as smooth as a mason's sign, and as fine as a harlequin; we can pave with tiles to any pattern; and we can polish every bit of marble we find. These great things we English of the nineteenth century *can* do; and by doing them, show that we would do greater if we *could.*

It is hard to say what is the greater paradox in modern restoration; that an age should set itself up to restore that of which it can produce none of its own, or that things should be worth copying, and yet be destroyed to make room for their copies. When valuable MSS. are copied, is the architectural method followed? Is the old writing erased line by line, to save material on which to write the copy? Common sense would seem to suggest that what is worth copying is worth preserving; and that an original, in ever so decayed a state, must be at least worth any copy taken from it in that state.

Alas for the Gothic artists' choice of stone! But they had no chemists, no physicists, no commissions of inquiry; and they little guessed the dilemmas its decay would bring on us. Alas, they knew not the time would ever be that the world could not replace the least of their works!

The old building adjoining the south-west tower is the "Jerusalem

Chamber," in which Henry IV. breathed his last, having been seized with apoplexy while at his devotions before St. Edward's shrine, and preparing to depart on a crusade.

> "It hath been prophesied to me many years
> I should not die but in Jerusalem,
> Which vainly I supposed the Holy Land:
> But bear me to that chamber: there I'll die:
> In that Jerusalem shall Harry die."

Here the two Houses of Convocation still nominally meet. Its date is about the accession of Richard II., of whom it contains a curious cotemporary portrait. Of the same date, or rather earlier (1364), are the south and west cloisters, and the passage into them from Dean's Yard. But the north and east walks, adjoining the church, are of the golden age, and very lovely. We doubt if the most ignorant of architectural styles can pass from them to the later ones without perceiving the fall of art begun, or rather the fall of the whole atmosphere of the age;—without perceiving that the spirit of the thirteenth century is fled; that the age is no more one having a meaning for all its arts, whose arts were all a hymn of praise; that their object is beginning to be human applause, or fashion, or priestly imposition and gain; that *effect*-hunting is come, and husbandry of thought, with its stiffening methodization; that the first step is made towards engineering.

The modern monuments in the cloisters are not numerous, nor very noticeable. In the south walk are the graves of several of the abbots of the eleventh and twelfth centuries, but distinguished only by modern inscriptions of the name and date, and wholly foot-worn effigies lying half under the stone seat. The calm and solemn beauty of these cloisters makes them a retreat unparalleled in London.

They are greatly mistaken who suppose this beauteous pile derives its only or chief interest from the past—that it tells only of glories departed never to return—of phases of society superseded and extinct, and varieties of human industry not to be repeated. It has not more matter for mourning than for hope—it is not a whit more precious for its records of what *has been*, than its foreshadowing and resemblance to what *shall be;* for the beautiful and true do not (in *any* variety of human work) die out of the world; but (as surely as wrong shall not prevail over right) they shall revive, even if forgotten longer than St. Edward's "Seven Sleepers." The beautiful works of the thirteenth century are not behind, but immensely *in advance*, of our civilization. They mark the point reached in its former efforts by a kind of human progress now stagnant, providentially allowed to stagnate (as its higher kinds often have been, by inscrutable Wisdom), while lower, comparatively animal kinds alone advance. Low and little, very little, is the humble office of our poor steam-driven matter-ridden selves, and the time in which our lot is cast. We may know this from the very extravagance of its self-applause; for the meanest servants in a great house are always the proudest. One of the greatest wonders of these wonderful things of the past is, that they who did them never boasted of them. All history shows that neither men, nor countries, nor times, take the pains to blow their own trumpets, who give any reason for others to save them that trouble. The times that do things really great leave others to find that out, as these monks did.

Of course, when we speak of revival, we mean no allusion to the present melancholy attempts at reproducing the *effects* of mediæval art without its *cause.* They have done all they can, they have achieved their end, and (whether continued, or soon to give place to something as absurd, or more so) they will achieve the same end and no more, viz. to amuse the vulgar, disgust the thinking, form nine-days' wonders, forgotten before they are well finished or their authors leave the scene, and stand laughing-stocks ever after. The *cause* must return *before* its effects; and it *will* return. This pile, which we call old, though unfinished, but which some nations (had it been built with their materials) would have considered yet in its youth—this pile may not see it; its youngest and stoutest neighbours may not see it; but as surely as wrong shall not eventually expel right from the world, shall all that was right in the spirit that begun this Abbey—all that produced its beauty—revive to walk the earth again, and produce like effects, and greater. Interesting for its past history it may be, but more interesting as a work which (like those of classical antiquity) may live through a whole night to another dawn; may have its chief influence yet to exert; may possibly (if not in its bodily presence, at least in its multiplied representations) survive to times in which the very *cause* of its own beauty, that did but blossom when it was begun, and faded long ere it was left off, shall take deeper root, spread wider, and bear richer fruit than it ever then did. (See also pages 143–172.)

RAILWAY STATIONS IN LONDON.

In the year 1830, the first railway was opened in England for steam locomotive traffic, between Liverpool and Manchester. Since that date, the progress of an invention by which time and space are nearly annihilated, has been so rapid, that at the close of the year 1850, upwards of 6000 miles of railway were open to public use in the United Kingdom. The history of the development of this source of improved means of intercommunication has been attended with many sad episodes, and it may recall to many the recollections of bitter deceptions, and of heavy losses; but, as far as the public alone is concerned, the result of the labours of the last 20 years has been unquestionably to endow the country with one of the most powerful and efficient means of civilization. We will, however, confine our notice to the principal stations in the metropolis.

These may be enumerated as consisting of the stations of the Great Western Railway, the North-Western, the Great Northern, the Eastern Counties, the Blackwall, the South-Eastern, Brighton and South Coast, and the South-Western Railways. Comparatively speaking, a small but highly valuable link in the general system of railway traffic, viz. the Birmingham and East and West India Docks Railway, is hardly complete enough to justify our doing more than thus to call attention to the many very remarkable and beautiful works comprised within its length. The main interest of this line consists in its connecting together the whole system of railways on the north of London; and if a projected branch be carried out, it will also be the means of completing the circle of ironway round London. The stations do not present any very remarkable points of interest, and therefore we shall but allude to them in passing.

1. *Great Western Railway.*—The London station of this line, which communicates with the west and extreme south-west of England, is situated in the parish of Paddington, close to, and below the level of the terminal wharf of the Paddington branch of the Grand Junction Canal. The position and actual arrangements of the station were only designed as temporary; and it would, perhaps, under such circumstances, be unfair to dwell upon them with so critical an eye as if they had been designed for the permanent terminus of a main trunk line. The same fact of the temporary destination of the whole constructions may extenuate their very slight, hasty, and ill-considered arrangements; for, in face of the great assumptions of superiority claimed by the advocates of the "broad gauge," for all connected with their system, we are certainly entitled to expect greater perfection of detail in their works than in those of the more modest, but more rational, "narrow gauge" engineers. The attainment of novelty, when only justified by *its* novelty, seems, however, as little to be desired on railways as on any other occasion.

The station of the Great Western Railway occupies more particularly the ground between the bridge at the end of Westbourne Terrace, and the lands belonging to the Grand Junction Waterworks. It is so difficult to obtain statistical information from this Company, that it is impossible to give either the precise area or the leading dimensions of the different parts of the works. Their main arrangement is, however, as follows.

Travellers approach the booking office from the Bishop's Road, by an incline passing between the canal on the east, and the goods and cattle station of the railway on the west. There are two departure lines, one reserved for the long, the other for the short traffic, with spare lines under cover, to hold the trains made up for departure and the carriages ready for use. A narrow court, in which it would be impossible for any but a London driver to turn a vehicle, separates the departure from the arrival platforms. These last have also two lines of rails, the precise destination of which is regulated by the station master, according to the wants of the service. The waiting-rooms, booking and paying-offices are very temporary and incomplete; nor can the sheds be cited on any other score than as sheltering tolerably the carriages in this eminently provisional station. The only details worthy of particular notice are those connected with the distribution of luggage, by which less confusion arises here than at the other London termini, and the absence of turntables, whose places are ingeniously and effectually supplied by a series of traversing platforms.

The goods traffic is carried past the passenger station, and all such articles as require to be kept under cover are loaded and unloaded in a shed with three lines of rails in the centre, two platforms, and two carriage roads on the same level as the rails; the platforms being raised to the respective levels of the carts, or of the railway trucks. Beyond the carriage roads are sheds inclosed by gratings, for the purpose of storing goods left at the station for any length of time; the goods deposited on the platforms are taken away within the 24 hours. Communication is established between the unloading platforms and the stores by means of flying bridges, let down for the purpose. The centre line of rails is destined for the removal of the unloaded trucks; the side rails, close to the platforms, are devoted to the in and the out traffic, the length of the shed being such as to allow about 15 waggons to stand on each side at one and the same time.

The heavy traffic (such as stone, timber, iron, or other such articles, and cattle) is carried on in an uncovered area, south of the parts of the station hitherto noticed. There are two very extensive and beautiful travelling cranes employed for the unloading and stacking the Bath stone conveyed in large quantities by the railway. The arrangements for unloading cattle are very unsatisfactory, nor can any commendation be given to the mode of disposing of the spare waggons, which are left in an open ill drained yard—a very slough in wet weather. Indeed, the whole goods arrangements bear evidence, not only of the temporary nature of the station, but also of the further fact, that this is not the most important nor the most lucrative source of income to the Company.

The shops at the London terminus of the Great Western Railway are of the same nature as the other constructions; that is to say, they are temporary, and ought to have been cheap. The carriage repairs are executed here for the London end of the line, and many carriages are also built here; but it would be in vain to seek for any particular organization, or for any remarkable implements; everything is as rude and imperfect as it would be on an American railway; even the smith's fires are blown by bellows worked by hand. There is a rather large shed for the working engines, extensive coke and other stores, and a long suite of offices, board rooms, &c.

Like most of the railway companies whose termini are in London, the shops of the Great Western Railway for repairing the locomotives and constructing new ones, are at an intermediate point on the line. In this case Swindon is the place chosen, and the establishment has been formed for the probable necessity of turning out one locomotive in a week. Actually, the wants of the line are far below that number, and the shops remain as additional proofs of the miscalculations of the era of public delusion in which they were erected.

The number of miles of railway which use the Paddington as their London terminus may be taken as nearly 375, without including some branches of the broad gauge. There are usually 14 trains out per day, and as many in for the passenger traffic only; and generally four trains of goods, bringing perhaps, on the average, 1000 tons per day.

The goods engines have three coupled wheels on a side, 5 ft. diameter; the engines for the express trains have lately been made with eight wheels, the driving wheels being 8 ft. in diameter. The ordinary locomotives have been so often described, that a more definite notice of them is not required on the present occasion.

2. *London and North-Western Terminus.*—The directors of this railway, wisely foreseeing the development their traffic was likely to assume, took the precaution to secure in the commencement an ample space of ground, so as to be enabled to develope their trade facilities according to the future exigencies of their line. Unfortunately for the shareholders, the same enlightened prudence has not regulated the decisions of the ruling authorities in all the details of the constructions; consequently many, nay, nearly all, of the original buildings have been demolished, and the existing station in no way resembles that which was built about the epoch of the opening.

The whole system of railway travelling was, however, so new, and the revolution it was destined to effect in all the habits of life so dimly foreseen, that it is not wonderful that the calculations of its most sanguine advocates should have been thus surpassed. The accommodations offered by the North-Western Railway Company have kept pace with the demands for them, and now, after having been frequently altered, not only in detail, but also throughout, their London terminus may be cited as the most perfect and the most commodious of any. It is situated, for passenger business, at Euston Square, and for the goods business at Camden Town.

The passenger station near Euston Square occupies a surface of about 12 acres, in which the operations necessary for the dispatch and reception of not less than 18 trains each way per day, are carried on with so little noise, confusion, or semblance of bustle, that it would almost seem that these complicated arrangements acted of their own accord. The entrance to the station is through the gigantic and very absurd Doric Temple placed in the centre line of Euston Square, but without reference to the court yard it leads to; facing it is a large, massive, plain range of buildings containing the offices, waiting-rooms, and board and meeting-rooms of this Company. Passengers pass firstly into an immense and beautiful hall, with a ludicrous cage for the sale of refreshments in the centre; those who intend to travel by the main northerly lines, proceed to the booking-offices on the east side; those who intend to travel by the midland lines, proceed to the booking-offices, &c., on the west side, from which also it is usual to start the express trains. The booking-offices are very fine specimens of architecture, but the waiting-rooms are far from corresponding with them in magnificence. Indeed, the habits of our travelling public are not such as to require much accommodation in the intervals during which they wait for the departure of the trains. At foreign railway stations passengers are not allowed to go upon the platform until just before the time for departure. In England the practice is to allow the public access to all parts of the station devoted to the dispatch of the trains; and, consequently, it is found that they prefer walking about the platforms with their friends until the last moment. A very social result, perhaps; but the presence of so many strangers must sadly interfere with the execution of the duties of the Company's servants.

The extensions, branch lines, and the immense number of country lines which communicate with the London and North-Western Railway are so numerous, that it is impossible to say precisely the number of miles over which passengers are booked here. A rough calculation from the time tables would show that certainly not less than between 700 and 800 miles use the Euston station as their London terminus. As was before stated, the "*out*" trains of the main line leave upon the rails next the waiting-rooms on the east side, those for the midland counties leave upon the rails on the west side. The "*in*" trains all arrive on the line on the extreme east of the station, where there is a platform and a road for public and private conveyances to transport the crowds who arrive. There are several spare rails under the same shed roof, upon which the carriages are examined, cleaned, and arranged for departure, and at the end of the passenger platform is a series of turn-tables to pass the carriages to the midland rails. The whole of the operations connected with the reception and dispatch of the trains are thus carried on under a shed of immense superficial extent; but too low, or at least without sufficient ventilation, to allow of the rapid escape of the steam from the locomotives. Some idea of the extent of this shed may be gathered from the following fact extracted from the delightful book of Sir F. Head, called "Stokers and Pokers," viz., that there are not less than 8979 square yards of plate-glass in the skylights only.

On the west of the lines leading from the station are the shops where the carriage repairs for the London end of the line are effected; they are very extensive, and would well merit inspection on account of some ingenious contrivances for the purpose of passing the vehicles from the different lines to others where they may be required, and on account of the tools employed in the different shops. There is a very beautiful smith's shop with sixteen fires arranged round a central shaft, a set of lathes, boring, screwing, and punching machinery, circular and upright saw frames, &c., all of which are put in motion by a very compact and efficient steam-engine of sixteen-horse power. No carriages are made here, the Company finding it preferable to deal with private contractors.

The line between the Euston and Camden Town stations is principally carried in cutting below the neighbouring streets. The works were executed in the London clay, and although neatly carried out, sufficient precautions were not taken against the future action of the land waters. It has been found necessary, therefore, to consolidate the retaining walls by a series of immense cast-iron struts, which cause this portion of the line to resemble an open tunnel, if such a phrase be allowed. After traversing the bridge on the Regent's Canal, we enter the goods station, certainly the most convenient of any in London, and, with the exception of the embryo station of the Great Northern line, the largest we can boast of. The general plan of the whole of this establishment may be briefly stated thus. The goods and coal traffic, the coke making, and the waggon repairs are carried on in the portion upon the east of the main line; the engines for the goods trains are also placed in reserve on this side; the engine house for the passenger train locomotives, and the shops for the small locomotive repairs, are placed on the west of the main line.

Whether wisely or not it is not for us to to say, but the London and North-Western Company have made arrangements with some of the great carrying houses for the collection and distribution of the goods and parcels addressed to them, to and from London. The establishment of Messrs. Pickford and Co. is the best and the most elaborately organized; for, although the sheds of Messrs. Chaplin and Horne's receiving-houses are very conveniently arranged, the means and appliances in the former establishment are much more elaborate and complete. Messrs. Pickford's shed is 300 ft. in length by 217 ft. in breadth, and is so well organized as to allow an average movement of goods to the extent of 850 tons per day. A steam-engine of 12-horse power works 30 steam cranes, and a lift able to raise about 1½ ton, with a series of oat-crushing, chaff-cutting, hay-cleaning, and other machinery for the preparation of food for the horses, besides working a pump which raises water from a well in the chalk at a depth of 380 ft. from the surface. There are no less than 800 ft. of shafting required to give motion to all this machinery; a set of traps in the floor afford also the means of communicating with the barges upon the Regent's Canal.

Messrs. Chaplin and Horne's sheds are far from being so extensive as these, and the whole of the operations connected with the manipulation of the goods are effected without steam power; they have no immediate connection with the canal.

Sir F. Head gives the following details of Messrs. Pickford's establishment, itself a curiosity, an "imperium in imperio." There were when he wrote no less than

Clerks.	Porters.	Horses.	Vans.	Waggons.	Drays.
234	538	396	82	57	25

and certainly they have since then rather increased than diminished.

The coal traffic has been of so modern an introduction, to the London end of this line at least, that the arrangements for its reception are as yet but very temporary and incomplete. It must, however, be a source of congratulation to the London public, that the long-borne and heavy monopoly of the Newcastle Field coal-owners has been at length broken by the introduction of the new and beautiful varieties of coal from the Clay Cross and Kennel districts. The arrangements for the reception of cattle are equally effective with those for the reception of coal, and they appear to be equally provisional.

There are on the average nine goods trains dispatched from, and received at, the Camden Station every day.

It has been found that the manufacture of coke in London is more expensive than to transport the already made coke from the coal districts of the north; consequently, the eighteen ovens near the Regent's Canal, although fully worked, are regarded more as guarantees for the regularity of the London service, than as efficient sources of supply; they are stated to yield 360 tons per day, or about two-fifths of the total quantity consumed at this end of the line.

Beyond the part of the station thus reserved for the goods traffic are, firstly, the shops for the construction, maintenance, and repair of the goods waggons, in which is a collection of tools, lathes, &c., driven by steam, as well worthy of inspection as that at Euston Square. This is succeeded by a very solid, imposing looking building, polygonal in plan, destined to receive 24 goods locomotives; the walls are of great thickness, and in brickwork; the roof is mainly composed of cast and wrought iron—a very equivocal combination in such situations, for the gases evolved from the locomotives usually corrode the iron. At the entrance are coke-stores, waiting-rooms for the engineers, and a set of offices connected with this department.

The passenger train locomotive sheds are, however, the most magnificent; they are 400 ft. long by 90 ft. span, covered by a very beautiful specimen of combined timber and iron framing, on the Queen-post principle. The sheds are destined to receive 40 locomotives at a time, and are usually half full. The attention of professional readers is drawn to a practical defect in the position of the skylights, owing to the chimneys of the locomotives standing directly under the glass on the two outside lines. It has been found in practice, that the unequal movements produced in the glass by the heated vapours from the engines impinging directly upon it, caused the glass to break to a very considerable extent; to remedy this defect as far as possible, a kind of suspended scaffold has been placed over the position occupied by the centre of the rails; but it appears, as it is, a very clumsy makeshift; the lesson should not, however, be lost upon professional men.

As all the heavy repairs of the locomotives are executed at the Company's workshops at Wolverton, nothing is done here beyond such works as are requisite to maintain them in ordinary working order. The most important function of the steam engine near these shops is to raise the water from a well, said to be 140 ft. deep, for the supply of a considerable number of houses near the Camden and Euston Stations belonging to the Company.

In concluding our necessarily brief notice of this railway, we would beg leave to record our sense of the extreme urbanity of all the parties connected with it. Their politeness and desire to aid any investigation on the part of those known or presented to them, contrasts very forcibly with the reserve and caution superinduced upon the employés of the Great Western Railway by the narrow-minded jealousy of their directors. At the same time, we would again refer our readers to the witty, sparkling, but equally clever essay of Sir F. Head already mentioned; in it are many statistics and many details we have been obliged to omit, conveyed in the most humorous and easy style.

3. *The Great Northern Railway.*—Definitely it is intended that the passenger station of this great trunk line shall be placed upon the site of the old Small Pox and Fever Hospital, King's Cross; and just as a lover of the picturesque, or of the agreeable in external objects, might regret the position of the Camden Station in the lately beautiful fields, just so much must he rejoice that the awful rookery at the back of the St. Pancras Road has been to a great extent swept away to make room for the buildings of the new railway station.

The works at King's Cross are at present in a very imperfect state, and it might be premature to describe even the projects. Railway boards are notoriously given to change their plans, nor are railway engineers more stable in their intentions. What we might say would very possibly, therefore, be found totally at variance with the works as finished, and it is even with hesitation that we venture to describe the works at the goods station which are either actually finished or in course of rapid completion. The provisional character of the earliest works of all large stations, and the modifications invariably found necessary in carrying out the details of the traffic, may serve as our excuse for any differences to be observed between our descriptions of the principal intended arrangements now in course of execution, and those hereafter applicable to them.

The approach to the temporary passenger station is from a wide road leading from King's Cross to the Company's lands on the north side of the Regent's Canal. The booking-offices and waiting-rooms are placed parallel to the outgoing line, which is continued beyond the incoming line by the whole length of the offices, &c., in question. A wide quay separates the two lines for a considerable distance further, and with a spare carriage line both on the in and outside, and a roadway for public and private conveyances, is covered by a light and rather elegant iron roof. The shed over the incoming line is prolonged beyond that of the outgoing towards the north, nearly as much as the latter is towards the south.

These are only provisional arrangements, and consequently the offices are of a character equally marked by the temporary appearance they present. No carriage-sheds, shops, nor definite engine-sheds are constructed, nor are even the large buildings for the reception of the goods traffic very far advanced. Enough is, however, done to convey a tolerably correct idea of the magnificent scale on which it is proposed to establish them. On the west of the actual passenger station we find, for instance, a goods shed 600 ft. long by 350 ft. wide, terminating with a row of warehouses, several stories in height, and facing the south, for the reception of corn, flour, and other agricultural produce. The distribution of the shed may be described thus: the building is divided into three portions, by means of longitudinal walls, separating respectively on the east and the west a subsidiary shed for either the in or out goods traffic, consisting of two side cart-roads, running longitudinally and parallel to the rails, from which they are separated by a rather wide platform for the reception and classification of the goods; only one line of rails exists in the portion walled off for the particular purposes of the in and out goods trains. A series of turn-tables on these rails enables the waggons to pass into the centre part of the shed, as soon as they are loaded or unloaded, through a corresponding number of sliding doors, exactly opposite to other doors in the outer walls, communicating with the access roads. The central portion of the shed is divided into 4 bays, with 3 sets of rails in each, to allow of the making up or dividing of 12 trains under cover. The roofs over this portion are of wrought iron; those of the loading and unloading sheds are principally of timber.

In each of the unloading and loading sheds there are 18 cranes for the purpose of assisting the manipulation of the goods. A set of traps in the platforms also afford facilities for the barges from the canal to receive or discharge their goods directly. Similar facilities are offered in the great end warehouse, which also communicates directly with the canal by means of a tunnel passing under the access road. There is a rather large basin formed for the reception of the barges employed in this part of the traffic, leading by a short cut into the Regent's Canal. It is impossible to estimate the effect likely to be produced on both means of conveyance by this intimate junction; but it affords a subject of contemplation replete with interest to the engineer.

Little progress has been made hitherto with the erection of the stages and shoots for the storage and delivery of coals, from which traffic it is evident that the Company count upon large returns. The works projected, and of which the execution is already so far advanced as to allow an opinion to be formed of the contemplated arrangements, are designed to form 4 large groups of coal-stores, of 50 bays, each capable of containing 70 tons, or a grand total of 15,200 tons. A very ingenious contrivance allows the coal to pass from the waggon to the lower level of the store without serious shock, and obviates the danger of comminuting the materials. In the floor of the stores are a series of shoots, six to each bay, through which the coals can either be discharged in bulk, or their flow can be regulated so as to allow of their being easily put in sacks. There is a direct cut from the coal-stores to the canal.

It is proposed to construct the locomotive and carriage department on the remaining portions of the land towards the north-west, for a connection with the water carriage is by no means of essential importance to them. The whole land occupied by the complete works of this goods station is intended to be about 45 acres.

The system adopted on this line of railway of burning the clay found in the excavations, for the purpose of making use of it as ballast, is a most admirable contrivance for getting rid of a troublesome material, and of turning it to good account. This ingenious, yet simple, notion cannot be too much brought before the notice of engineers; and, at the same time that we dwell thus upon the skill and talent displayed in the execution of these works, we would also beg to record our acknowledgments of the courtesy of those who have so skilfully conducted them.

4. *Eastern Counties Railway.*—The London terminus of this line, both for passengers and goods, is in the parish of Shoreditch, many of the worst parts of which have been cleared away for the purpose of its construction. Compared with the North-Western and Great Northern termini, it is small and confined, but the immense amount of traffic carried on argues at least that the organization of the service must be very effective, and that the duties of the various parties employed must be carefully and faithfully performed.

From the street the railway is approached by a spacious court, giving access both to the offices of the Company, placed transversely to the line, and to the booking-offices on the north side parallel to the outgoing rails, and the incoming platform and carriage-roads on the south. As the railway is carried through the greater part of the town on arches at a higher level than the surrounding streets, it has been necessary to make the access roads on an incline, with a bold sweep on the north and south sides respectively. It is rather unfortunate that advantage has not been taken of the peculiarities of this position to give a more monumental character to the central pile of buildings. It is respectable, but feeble, in its architectural effect; too much cut up into small parts, and without mass.

The traffic for the main lines is carried on in the portion of the great shed situated towards the north. The booking-offices and waiting-rooms, plain but suitable constructions, are placed, as was before said, parallel to the lines of rails. A shed, covered by a light wrought-iron roof, supported on cast-iron columns (which is open to the usual objection of our London termini, namely, that it is far too low), protects the in and out lines, with a set of rails for spare carriages, and for making up the trains. The arrival side has a platform and road for public and private vehicles, also under cover, as is usually the case in the London stations. The length of the shed is sufficient to allow about sixteen carriages at a time to stand on the departure line; but on the arrival side there is an overhanging shed, affording shelter to a platform, extending some considerable distance down the line.

The coke-stores and water-column for the locomotives working on this portion of the line are placed near a siding close to the main line; beyond them is a siding for the light goods traffic, such as milk, poultry, and dead meat, sent from the country; and this siding communicates at once with the access road on the north. A set of lines, with a platform on one side only, is carried out beyond this again for the North Woolwich and short traffic branch. It is principally supported by an immense timber substructure. The ticket platform is situated on the arrival line, but of late the Eastern Counties Railway have very wisely adopted the plan of collecting the tickets at the last station on the line before arriving in town, thus saving the public at least ten minutes' unnecessary delay, which occurs on the other lines of railway where they are collected at a station etablished solely for that purpose. No engine or carriage sheds exist near the Shoreditch station, and consequently the spare lines at the London end are covered by carriages ready to supply the variable demands of the traffic. It is unfortunate that such valuable property should be left thus exposed to the destructive action of our variable atmosphere, and perhaps the general want of shed room to be observed in most of our London termini may account for the dirty, disreputable condition of the greater number of railway carriages.

Elevated as this station is upon arches, it would, necessarily, be very expensive to construct any shop or shed accommodation on the level of the rails; especially as in so densely-populated a part of the town land must be exorbitantly dear. The same economical conditions must also have guided the designers of the goods stations, but the manner in which the difficulties have been overcome, and the skill with which the Company's servants avail themselves of the various means and appliances afforded to them, cannot be either too highly praised, or a source of too exaggerated surprise; indeed, there are few sights in London more worthy of careful examination than the goods arrangements of the Eastern Counties Railway.

On the rails level, upon a series of arches, are the spare lines, upon which stand the trucks prepared for departure, or which may have arrived from the country. The quays for loading or unloading the goods are situated on the lower level, that is to say, on the level of the streets, and the waggons are respectively raised or lowered by means of two steam lifts. These quays and lifts are on the northern side of the main line, and the former consist of two ranges of warehouses arranged on somewhat different principles. The eastern warehouse consists of two sets of rails in the centre, with a platform for the reception of goods, and a cart-road by the side of each; the western consists of a double set of rails in the centre, with a series of bays, or indentations, able to receive one waggon in length, and with two rails. There are thus sixteen turn-tables, and quay face for the broadsides of 24 waggons, besides end face (so to speak) for two more. Cart-roads give access to the platforms nearly as in the eastern warehouse. The advantages and the disadvantages of the two systems of arrangement seem to be that in the eastern warehouse only sixteen waggons can load or unload at one and the same time, whilst the expense of turn-tables is reduced to a minimum; in the western warehouse 22 waggons can load or unload, but it is necessary to lay down sixteen turn-tables in addition.

The steam lift is able to raise nominally 13 tons, which in all probability is a maker's exaggeration, for it can be very rarely that more than 8 tons can be put upon it at once. The height of the lift is 24 ft., the engines 12-horse power.

On the "up," or arrival side, is an immense warehouse for the reception and storage of corn or agricultural produce. It contains three sets of rails on the upper level, by which the waggons can be run into the interior of the store, and is six stories in height. Its capacity is intended to be such as to receive 60,000 qrs. of corn; but, of course, as the arrivals by railways are usually cleared away as soon as they come to hand, it is impossible to state any precise quantity as existing in them. There are a series of shoots, cranes, and other machinery for the expeditious discharge or stowage of the goods. Similar facilities are also provided in the goods station at the lower level.

The carriage and engine sheds of this line, with the shops for the repairs of the locomotives, carriages, waggons, &c., are at Stratford, and thus can hardly be said to enter into the limits proposed for our Guide. They are, we may however observe, tolerably complete, although far from being on the same scale of magnificence as the North-Western Railway Company's establishment at Wolverton.

It is difficult to say how many miles of railway use the Shoreditch station as their terminus; but they may, as an approximation, be stated as above 300 miles. Seven trains enter and leave the station for the main traffic, and the North Woolwich trains run every half hour. The quantity of goods received varies of course with the season, but the arrangements in the lower station are so well made that it would be possible to expedite, in both directions, about 1500 tons; and the usual movement of goods in the large store or granary is stated to be 400 tons per day.

5. *Blackwall Railway.*—The passenger station of this railway, in the heart of the city, is situated in London Street, Fenchurch Street, in a very crowded, confined part of the town, with an access of great difficulty. The booking-office is on the ground floor of a building very plain and unpretending in character. Staircases, leading to and from the arrival and departure platforms, are placed immediately beyond these offices. At the head of the upgoing staircases are two rather narrow platforms on the right hand and on the left; two lines of rails, with an intermediate and rather wider platform, lie between those first named. A low and very badly ventilated roof covers these lines and platforms, and beyond them again are a series of temporary waiting-rooms.

The rails, waiting-rooms, and platform on the right hand, or the south, are reserved for the traffic of the New Birmingham and East and West India Dock Junction Railway, which branches on to this line at Stepney. Those on the left, or north side, are reserved for the direct Blackwall traffic. The intermediate platform serves for the arrival of both railways.

It is wonderful to observe the apparent indifference with which the servants of the Company go through the very arduous and even dangerous duty of expediting and receiving no less than four trains per hour, in each direction, on each of the above railways, which, from the terribly cramped position of the station, are obliged to go out and come in on the same line. In both cases the engines are detached from the incoming trains at a short distance from the station; those which bring in the Blackwall carriages continue alone on the same line they had travelled on; the train, however, passes over some points and runs into its bay between the three platforms. Whilst the passengers are hurrying out upon the intermediate platform, the engine returns, takes the crossing through which the train had passed, and puts itself at the head of the train, without reference to whether the tender be foremost or no, and takes it out on its down line when the moment for starting arrives. The Junction Railway traffic is managed nearly upon the same principles. The engine, however, on approaching the station, detaches from the train, crosses, lets the train continue on its own line, returns, and, when leaving the station, crosses over to the down line with the train. All these complicated arrivals and departures are thus effected by means of two through crossings, without any turn-table whatever. Indeed, the extent of the traffic, and the exiguity of accommodation at this station appear to prove that engineers have hitherto greatly exaggerated the amount of accommodation in similar situations. Notwithstanding that so many trains are continually crossing and re-crossing this line, we do not hear of any accident, or at least only at very remote intervals. Certainly there are as few here as on other lines.

Equally remarkable with the passenger station is the goods station at the London end. It is situated near the Minories, and consists merely of a siding entered by a pair of back points from the up line, and of sufficient length to receive seven carriages at a time. A stage about 25 ft. wide on the average, with three traps, one for letting goods down directly to carts on the ground floor or street level, by means of a crane; and the others to slide bag or bale goods to an intermediate story provided with similar shoots, runs the whole length of the siding as far as the trucks can be brought up to it. In addition to the crane over the trap is another on the upper level to load or unload the trucks; and on the ground floor are some other cranes for the use of the waggons. Rude and confined as these arrangements are, they suffice for a movement of about 100 tons of goods per day; but it is to be observed that the habits of expedition in all business affairs in the City must render this result more easily attainable here than elsewhere.

The intermediate stations on the Blackwall line are of a very mediocre character. The station at Blackwall itself is a more noticeable piece of architecture, especially towards the river. As a station, it is very little worthy of remark after a visit to the Fenchurch Street terminus; nor are the shops or the carriage sheds more worthy of attention.

On the recently-opened line of railway, called the Birmingham and East and West India Dock Railway, the stations in the intermediate parts of the line are very insignificant constructions. At the utmost, they suffice for the shelter and reception of passengers; as buildings they are beneath notice, nor are there any arrangements for facilitating traffic sufficiently remarkable to warrant our dwelling upon them in detail. In justice to the parties connected with the line we must, however, observe that hitherto the opening has only been partial; and that the definite arrangements can hardly be judged of in the unfinished state of the road. Neither terminus is complete; nor are the junctions yet effected with the other lines on the north side of London, over or under which this one passes. There are, in the distance traversed by the Birmingham and East and West India Junction Railway, many very extraordinary works well worthy of attentive examination. The whims and exigencies of some landed proprietors, whose estates have been traversed, have forced the Company to erect bridges in many cases of very great span. These are for the most part frightfully ugly; nor does the mode of construction employed inspire much confidence. Yet it cannot be denied that the wrought-iron bridges on this line display a boldness in the use and adaptation of that material to such structures well worthy of remark, however little disposed we may be to praise the taste of their general forms.

The numerous accidents which have attended the construction of this railway, principally from defective foundations, call also for observation from all those interested in the true dignity of the profession of an engineer. Some public examination ought to be instituted into all such accidents; not of the illusory character which now prevails, but a real *boná fide* investigation, which should guarantee not only the lives of the workmen, but also the pockets of the shareholders, by making the parties really to blame amenable to public opinion, and to the pecuniary consequences of their neglect or incapacity.

6. *Dover, Brighton, and South Coast Railway.*—The joint station of these lines, which serves also to receive the traffic of the Greenwich and North Kent Railways, is situated on the south side of the Thames, in the immediate vicinity of the new London Bridge. The peculiar character of the first portion of the lines terminating in it (although perhaps the word "peculiar" is hardly applicable, for most of our

London termini are precisely similar to it), owing to their being constructed upon arches, has forced the condensation of accommodation to its extreme limits. The offices and sheds are far from presenting so monumental an appearance, or of attaining the development of those of the North-Western, or of the intended Great Northern Railways; but they are compact, and sufficient for the traffic they are intended to serve. It may, indeed, be questioned whether the last-named Companies have not laid out more money on this class of works than the real exigences of the case absolutely required.

From London Bridge the approach is by an inclined road, bounded on the south-west by St. Thomas's Hospital and grounds, and on the north-east by a range of shops, communicating with Tooley Street. The south-western portion of the building comprises the booking-offices of the Brighton and South Coast line; and on the extreme south is a screen, masking the gateway of the carriage-road upon the arrival side of this railway. A somewhat similar arrangement is observed immediately on the north of the Brighton Railway offices; where a gateway is formed, giving access to the carriage-road of the Dover line. The Brighton Railway Offices are thus placed at right angles to the axis of the rails.

The Dover booking-office faces the approach road, and forms the main portion of the façade. Beyond it is the North Kent booking-office, parallel with the lines of rails; and beyond this last again, at right angles with the axis of the rails, is the Greenwich booking-office. On the first floors of these several buildings are the offices, board-rooms, and other accommodations.

Extensive alterations are in progress on these works, so that, as in the case of the Great Northern line, we feel some hesitation in describing their arrangement. They may, however, be generally, and with sufficient accuracy, stated to be designed with the intention of providing separate lines for the in trains and for the out trains, with platforms for both, but with a carriage-road to the inside platform only. Passengers' luggage is seized upon on departure, in the manner so humorously described by Sir. F. Head, and carried by the porters to the vans or carriages in which it is meant to be transported. On arrival, it is left to the tender mercies of chance, for no precaution is taken to protect the contents of the luggage vans against the attacks of the London thieves. The out line platform is thus at the periods of the formation of the trains a strangely-confused passage for luggage, passengers, and their friends, so that it is marvellous how, in so narrow a space, the station work can be carried on. The waiting-rooms seem to be designed on a very small scale, and of an unassuming character; as to the general body of the buildings, very little can be said either in praise or blame. A fine situation has been lost in this case, as in that of the Eastern Counties.

There are spare lines for the reception of empty carriages under the same roofs as the respective arrival and departure lines. The roofs themselves are somewhat remarkable; and there are particular details connected with the roadway of a nature to merit prolonged examination.

Thus the Greenwich traffic is intended to be carried on upon two lines of railway, under a narrow and rather confined shed. The North Kent traffic is provided for in a distinct shed comprising three rails (one for arrival, one for departure, and one spare line for empty carriages), with platforms upon the departure and arrival side. The roof over this part of the station is of wood, and a very fair specimen of carpentry. But the most remarkable part of the whole establishment is the Dover shed; for there are few roofs in London to be compared with it, either on account of their boldness, or the scientific construction. It spans three rails, two platforms, and a carriage-road, without any intermediate support, and is really an object of considerable interest to the engineer or architect.

The portion of the shed surface of this station reserved for the Brighton and South Coast traffic, is rather less in area than that for the South-Eastern lines. Nor is the style of roofing adopted at all worthy of notice. The distribution of the rails seems to be designed for the purpose of appropriating one line to the departure trains for Brighton and the South Coast; another for the departures for Croydon and

Epsom, &c.; two spare lines for making up the trains succeed; and beyond them is the arrival line with a platform and a carriage-road.

It is utterly imposible to define the precise relations of the different companies which make use of this joint and multifarious station; for the fusions, leases, and other working arrangements are so complicated as to defy even the keenest perception of the more deeply-interested shareholder. At the same time it is to be observed, that every day appears to be adding to the extent, not only of the accommodation offered by the great railway stations, but also, and to a far greater extent, to the demands upon them. The particular class of lines connected with continental traffic are, more than any others, liable to this law of incessant and progressive development; nor, even for the interest of the shareholder, would it be desirable that it were otherwise. Our task as a guide is, however, materially increased; for it is beyond our power to follow, "pari passu," the changes either of destination, or of arrangement, in the stations of this class of lines. An additional difficulty occurs in this case with respect to the arrangements, from the fact that inasmuch as several of the small branch lines are especially destined for the suburban traffic, they become so far exceptional in their arrangements that their departures are more frequent, and even more subject to alteration than those of the lines with a more regular description of traffic.

However, in round numbers, we may state that about 500 miles of railway use the London Bridge Station as their London terminus. The Greenwich trains run every quarter of an hour. The North Kent line sends out about 20 trains between 7 in the morning and 10 at night; the Brighton line may be taken as dispatching eight trains, and the Dover nine trains per day; if to these be added the Croydon and the short traffic on the Brighton line branches, an amount of activity really marvellous may be stated to exist at the station under notice.

The engine accommodation here may be stated to be very small; nor are the spare carriage lines at all in accordance with what the real wants of the traffic must very often call for. These details, in fact, seem very defective in most of the metropolitan stations.

Before quitting the London Bridge terminus we would call attention to the essays being made, under the orders of Mr. Barlow, of a new system of continuous supports to the rails, with the view of dispensing with the existing illogical, and essentially temporary mode, viz. by laying them in cast-iron chairs, spiked to wood sleepers. The merits of an invention of this kind must be so essentially of a nature to be solved by their economical results, that in the present stage of its application it would be premature to pronounce a decided opinion either for or against it. At any rate, the experiment is interesting: if successful, our moist climate argues that its adoption will be a source of immense advantage.

The goods traffic upon the set of lines converging to this part of London is carried on principally, and with greater convenience than formerly, at the Bricklayers' Arms Station. The arrangements for the reception and delivery of the goods are in nowise remarkable, nor are there any warehouses or stores worthy of particular notice; it would, indeed, seem as though the directors of these lines confined their attention almost exclusively to the passenger traffic. Traversing, as so many of their branches do, the richest agricultural districts of England (those which produce the bulk of the wool and nearly all the hops), it seems strange that their goods traffic should be of a nature to permit of its being retained in a position so difficult of access, and so far removed from the centre of affairs, as the present station. There is ample room, and verge enough, it is true, at the Bricklayers' Arms, but when this has been said, we have exhausted the amount of praise it merits.

The engine establishments of all these lines are at points remote from the metropolis. They are upon a small scale, if compared with those at Wolverton, Crew, Stratford, or Swindon, nor would they merit an especial visit. The foreign engineer may, however, feel some interest in examining the few remaining traces of that singular delusion the atmospheric railway, which are still to be found on the Croydon line.

7. *South-Western Railway.*—Originally established at Nine Elms, Vauxhall, the terminus of this combined series of railways was prolonged, or extended, during the railway mania of 1846, to the Waterloo Road. The great crisis arrived before any progress had been made in the buildings, and the whole establishment at the present day bears evidently the impress of the circumstances attending its projection and its execution. There is so marked a desire to form an immense terminus to a great trunk line displayed in the selection of the situation, and in the nature of the works definitively executed; yet, at the same time, so ridiculous an attempt at economy in the construction of the offices, so half-starved an appearance about the sheds, that it would be difficult to point to any railway building about town as more forcibly illustrating the absurd visions or cruel deceptions of that notorious epoch, than the Waterloo Station of the South-Western line. It may "point a moral," and a severe and bitter one to thousands; but it is very far from presenting anything "to adorn a tale," even so simple as ours must be.

Raised upon arches, like so many of the other London stations, there is little room for development, on account of the frightful expense attending any extension of the surface. The width of the shed is then reduced to its extreme limits, and the very nature of other works tending rather to develop the station accommodation in the direction of its length, we find that, comparatively speaking, its dimensions are greater if so regarded. From the Waterloo Road, the approach to the booking-office is by a rather narrow, but exceedingly well-arranged road, which, by winding in an S curve, not only diminishes the draught, but also serves to mask the barrenness of the object to be obtained. The booking-offices and waiting-rooms are very temporary affairs, without the slightest pretensions to architectural effect, or to solidity of construction. The waiting-rooms are equally unpretending, and at most can only be said to shelter those waiting for the departure of the trains.

In the shed itself, here as elsewhere, the most important part of the station, there is a platform so arranged that it serves for two departure lines of rails. The short line traffic, such as the Putney, Richmond, Windsor, &c. branches, is carried on at the east end of the station, upon a line of rails passing to the north of the departure line of the main traffic. There are two spare lines for the cleansing, &c., of carriages, and making up the trains ready for departure; beyond these again is the arrival line. A wide platform receives the passengers and the unguarded, uncared for, luggage; and a roadway narrow enough to exercise the utmost skill of our London drivers, if there be any crowding, occupies the remainder of the space up to the parapet of the viaduct. There is an inclined exit road on the north side, precisely similar to the approach road on the south, and a staircase leading to a tortuous roadway which brings the foot-passenger bold enough, or sufficiently well acquainted with the intricacies of London, to trust himself to its mazes, to the new Hungerford Bridge.

The only remarkable object in this station is the roof over the shed; and it is far from being, either in design or execution, elegant, or such as scientific calculations would require. Indeed, it appears that a particular design for roofs over railway sheds has been stereotyped, and followed in the bulk of our stations; for they are nearly all erected upon the same principles, and all are equally slight, primitive in their construction, and deficient in taste. They look, in fact, as though a smith had been applied to for an estimate and contract, the mode of construction being left to his discretion. Possibly, the failures which have taken place in railway station roofs may be explained on some such grounds as these. Nevertheless, of the class in question, the roof over the Waterloo Road shed is perhaps one of the best.

The engine and spare carriage accommodation in this station has been reduced to the narrowest possible limits, on account of the expensive nature of the substructure, and also because the shops and carriage sheds are so much nearer the terminus than is usually the case in the railways terminating in London. They are, on the South Western lines, concentrated at Nine Elms, where a very efficient, if not a very magnificent, establishment has been formed, under the original direction of Mr. Beattie. These shops are organized upon a system of economy which is very rare in similar cases, but only the more entitled to praise on that account. Altogether, the shops at Nine Elms, although neither remarkable for their extent, the beauty of their tools, nor even the perfection of their arrangement, will repay a visit better than the generality of such factories would do, on account of the plain sound common sense which has prevailed in their disposition.

Between Waterloo Road and Vauxhall, and continuing until we arrive at the junction with the old line, now serving only for the goods traffic at Nine Elms, the roadway is carried through one of the dirtiest parts of London, upon a series of works which would also well repay the visit of an engineer. We would cite especially the portion near the Westminster Bridge Road, and that near the Vauxhall Road, as containing some of the most remarkable works.

The goods traffic is, as has just been stated, entirely carried on at Nine Elms, at an immense distance from the centre of the town, which inconvenience is augmented by the tolls upon the bridge and common road. There is a rather large warehouse upon the banks of the Thames, so arranged that goods can either be stored in it, or loaded at once into barges from the waggons, or *vice versâ ;* otherwise, there are no arrangements here worthy of notice; indeed, they may be said to be rudimentary and deficient in the extreme, without facilities either for the reception or expedition of goods. This is the more remarkable, because undeniably the south-west of England, if not actually, might soon be made a great producing district. Railroads are, however, destined to render much greater services to society than they have hitherto accomplished, wonderful as these have been. The first condition seems to be that new life be infused into the directing body in a considerable number of cases, so as to insure greater desire and effort to advance the public interest, and at the same time, and by the same means, that of the shareholder.

The number of miles of railway to which the Waterloo line was intended to serve as a terminus can now hardly be calculated. So many projects have fallen to the ground, so many of the magnificent visions of branches and extensions have passed into thin air, that the works undertaken in London stagger us with their disproportion to the lines they serve. It may be questioned if the actual mileage on this series of railways be above 250, yet the station has been carried, reckless of expense, into the very heart of the town. Had it been continued so as to join the South Eastern line, some explanation might have been found; as it is, the public certainly are the only gainers by the capital thus sunk, both in time and money: this is so rare an occurrence with trading companies, that perhaps it is unwise to dwell long upon the subject.

ROYAL ENGINEERS.

The Head Quarters of the Corps of Royal Engineers are at the Ordnance Office, Pall Mall.

Field Marshal the Marquis of Anglesey, K.G., K.G.H., &c., &c., is the Master General of the Ordnance, and is, *ex officio,* Colonel Commandant of the Corps, under whom are—

The Inspector General of Fortifications, Major General Sir John Burgoyne, K.C.B.

First Assistant Inspector General, Colonel Harding, C.B., R.E.

Second Assistant Inspector General, Lieut. Colonel Sandham, R.E.

Assistant Adjutant General, Lieut. Colonel Matson, R.E.

All the Fortifications and Military Buildings in the United Kingdom and its dependencies, India excepted, are designed and constructed under the direction of the officers of the Corps of Royal Engineers.

The Trigonometrical Survey of the United Kingdom and of many parts of the Colonies, has also been carried on under them; that of Ireland, on a scale of six inches to a mile, is perhaps the most perfect survey ever made; and the plan of the city of London, on a scale of five feet to one mile, the largest plan of a city which was ever made; this plan covers a space of 5400 feet, drawn on 900 sheets of drawing-paper.

In addition to the ordinary duties of the corps, its officers are frequently selected by Government to fill important offices requiring great ability and scientific knowledge, and to fill the office of Govenors of Colonies, among whom may be named Colonel Reid, C.B., the author of the "Law of Storms," and formerly Governor, first, of Bermuda and then at Barbadoes; he is now the Commanding Engineer at Woolwich, and takes an active part as Chairman of the Executive Board, in the preparations for the forthcoming Great Exhibition of the Industry of all Nations.

SALOONS.

Saloons are more French than English in the interior arrangement of their architecture; our houses are generally smaller considerably than those of France, Germany, or Italy. We have saloons in our theatres, and public places of amusement appropriated for promenade, and the sale of refreshments to the visitors. There are saloons in various parts of the metropolis, but they are appropriated for lower purposes, and the stranger should be cautious as to the character of such doubtful places previous to entering them. There is a saloon attached to the Eagle Tavern, which does not fall into the category just referred to. This saloon, it is said, is for concerts, balls, promenades, and refreshments. Saloons for music and dancing are licensed by the county magistrates. All those so licensed are strictly inquired into, and may be visited without outraging the feelings of decent people. A saloon in the palaces of Italy is a state room; in France, a grand room for reception; in England, in our noblemen's and gentlemen's houses, they are not unfrequently meant as drawing-rooms.

THE SEWERS OF LONDON.

When the Roman author had completed his survey of the stupendous aqueducts which adorned at the same time as they served his native city, he exclaimed with a feeling of self gratulation easily to be understood, "Tot aquarum tam multis necessariis mollibus pyramidum videlicet otisiosis comparem, aut cetera inertia, sed famâ celebrata, Græcorum opera!"

In our generation we may almost do likewise; for, although London underground is very far from being what it should be, although considering the immense progress made of late years in hydrodynamical engineering, our water-supply is very inferior, and our system of sewerage very rude and incomplete; yet, even if we lay aside all sentiments of nationality, we may justly pride ourselves that the sewers and water-supply of our great metropolis are as far superior to those of any other city in modern Europe, as those of Rome were to any in the ancient world. If, for instance, we direct our attention to Paris, or to any continental city, at every turn we are met with annoyances, here quietly and unostentatiously removed by agencies, and through an organization, whose existence is hardly suspected, until we inquire what becomes of the materials which elsewhere so annoy us. So also, bad though our water-supply is said to be, susceptible of immense improvement as it unquestionably is, there is hardly any city in the world in which this great necessity of life is attainable so cheaply or so copiously as in London.

We would expressly avoid taking up the position of advocates of things as they are, but the tendency of the day is so very decidedly to ignore the benefits we have derived from what has been previously executed, that we purposely step out of our way to call attention to the results we enjoy; may the success of our predecessors lead us to use aright the lessons they have garnered for our instruction!

The legal organization of the municipal duties falling under the generic name of sewers (the division of London under ground we are immediately examining) is of very early date in English history. In a country so damp as our own, one in which the rivers, or even the arms of the sea affect so greatly the value and the nature of property, it was necessarily of vital importance that works should be executed such as could protect against "the daily great damages and losses which have happened in many and divers parts of this realm, as well by the reason of the outrageous flowings, surges, and course of the sea, in and upon marsh grounds, and other low places, heretofore through public wisdom, won and made profitable for the great commonwealth of this realm, as also by occasion of land waters and other outrageous springs in and upon meadows, pastures, and other low grounds adjoining to rivers, floods, and other water courses." We therefore find that, so far back as 9 Henry III., 6 Henry VI., 8 Henry VI., 4 Henry VII., and 6 Henry VIII., partial statutes were issued for the purpose of regulating the conditions under which the requisite works were to be executed. These measures, owing to the circumstances of the times in which they were promulgated, could but be of a local and partial nature, nor was any general measure introduced until the reign of Henry VIII. That phenomenon in history appears to have laid the foundations of modern legislation in the class of works now under consideration, by his celebrated "Bill of Sewers," promulgated in the 23rd year of his reign (A.D. 1531), with the same foresight and intuitive perception of the future wants of modern civilization which we can trace in so many other acts of his reign.

The monarchs succeeding Henry VIII. from time to time promulgated similar statutes, or assented to acts of Parliament by which the original Bill of Sewers was continued, amended, and explained. For the country districts these acts still are in force, except in such cases as they may be interfered with either by local acts or by the act for Promoting the Public Health. In the metropolis, however, the legislature has been obliged to intervene frequently, especially within the last century, owing to the rapid extension of London, "to render more effective the powers granted by previous acts of Parliament for making, enlarging, amending, and cleansing the vaults, drains, and sewers within the city of London and the liberties thereof." The creation of new quarters of the town, themselves larger than the city, and the excessive division of local government, led to such a subdivision of the districts, that even so lately as the year 1847, no less than eight local commissions of sewers existed, exercising a divided and unsystematic sway over the sewers of the great metropolis. Each consisted of a board armed nearly with the powers of the existing commission; each had its peculiar mode of conducting business, with a special staff of engineers or surveyors, clerks, superintendants, &c., with peculiar regulations as to the size of drains, sewers, &c., their rates of inclination, mode of execution and cost; so that it was impossible to find two sections of the town sewered upon the same principles, or in which any co-relation as to cost or mode of execution could be observed.

The eight districts, for that was the number of separate jurisdictions existing, as said before, in 1847, were, 1stly, the City of London; 2ndly, the Tower Hamlets; 3rdly, Saint Katherine; 4thly, Poplar and Blackwall; 5thly, Holborn and Finsbury; 6thly, Westminster and part of Middlesex; 7thly, Surrey and Kent; and 8thly, Greenwich. By the act of 1848, all these were concentrated into one General Board, under the style and title of the "Metropolitan Commissioners of Sewers," with the exception of the local Commission of the City of London and the liberties thereof, which has been retained in its pristine state, probably because its abuses are so inveterately interwoven with our early prejudices, that they are retained as much from a feeling of superstition as of love. The jurisdiction of the New Commission extends "to all such places or parts in the counties of Middlesex, Surrey, Essex, and Kent, or any of them, not more than twelve miles distant in a straight line from St. Paul's Cathedral in the City of London, but not being within the City of London or the liberties thereof."

Really we may pause to inquire why the effete corporation of the city should be allowed to retain its privilege of exemption from the effect of every general measure for the public benefit; it is as though it were desired to form an Egypt of darkness in the midst of the enlightened progress of the rest of London!

Be this as it may, we repeat that the ancient system of local management produced results as multifarious as they were discordant. No system was observed either as to the dimensions of the main sewers, or their rate of fall, nor was any attempt apparently made to co-ordinate the works of the several districts to any one general plan. The Westminster sewers differed in their section from those of the Finsbury district, and the latter, again, from those of the Regent's Street Board. Nay, so little system appears to have been observed in these matters, that even at the present day it is impossible to obtain any very decided statistical information either as to the length or the dimensions of the sewers in the different parts of the metropolis.

The principal object proposed to be obtained by the new organization of the sewers was the attainment of unity in their direction. It is always difficult to change old habits, especially when the details of the old system are interwoven with the daily wants and necessities of a large population; but it would be difficult to point out any instance in which order has been introduced into the midst of chaos so successfully, and with so little interference with previous habits as has been done by the new Commission. These are matters of history, and as such may be left to explain themselves; nevertheless, it must be a matter of congratulation to all the world, that the previous disorder is at length yielding to something like a general system.

The act of 1848, under the powers of which the present Commission holds office, does not fix the precise number of persons who are to form it; the date of each commission, however, cannot exceed two years. The Lord Mayor is, "ex officio," a member, and the Aldermen and Common Council have also the right to elect four members, whose powers are equal to those of the Royal Commissioners. There is great ambiguity about the powers of these representatives of the city at the General Board of Sewers; nor does it appear from the text of the act that their functions were ever intended to exceed those of controlling the action of the board in cases affecting the City of London; any such questions, moreover, being only to be discussed at special courts, and due notice given thereof.

Six commissioners form a quorum, the chairman being elected on each meeting by a majority of votes. The most important business is transacted at the monthly courts, although special courts are held much more frequently. The details of the separate branches of the service are usually managed by a series of committees chosen by, and out of the body of the commissioners, the said committees fixing and arranging the periods of their meeting and the details of the mode of carrying on the business intrusted to them. One or two commissioners are named by the General Board for the purpose of verifying and auditing the accounts, subsequently submitted to the whole board.

The choice of officers, their rate of remuneration, and the regulation of all points connected with the discharge of their duties, are entirely under the control of the commissioners. It would be impossible at present to give any of these particulars precisely, for the creation of the system is too recent for any definite statement to be ventured on the subject.

One of the first objects proposed for the attention of the new Commission was the preparation of a plan or map of the metropolis, for the purpose of ascertaining more correctly what really had been done. The execution of this map has been confided to the Ordnance Office: it is nearly completed, and doubtlessly will form a document of extraordinary beauty and interest; but, in the mean time, a certain degree of vagueness must be attached to the definitions of the districts of sewerage about London, nor can the precise nature of the general system of drainage be exactly defined. Indeed, the very intention of the execution of this survey being to prepare the means of introducing a more definite and co-ordinate plan, instead of the different local measures hitherto adopted, it would be impossible to arrange the system until the physical aspect of the region to be worked upon has been distinctly ascertained. Perhaps it would be difficult to cite a more striking illustration of the defective nature of the old Sewers Commission, than is to be found in the fact of the necessity for this survey at the present day, and in the total ignorance of all that had been done, as well as the absence of all general system in what remained to be done.

The works over which the commissioners have control are the sewers, drains, watercourses, weirs, dams, banks, defences, gratings, pipes, conduits, culverts, sinks, vaults, cesspools, rivers, reservoirs, engines, sluices, penstocks, and other works and apparatus for the collection and discharge of rainwater, surplus land or spring water, waste water or filth, or fluid, or semifluid refuse of all descriptions, and for the protection of land from floods or inundations within the limits of the commission. Strangely enough, however, the only important causes likely to produce inundations, the Thames and the sea are entirely beyond their jurisdiction, and are actually as much as ever left to the tender mercies of separate commissions. It is fortunate, nevertheless, that so vast a stride has been made towards the introduction of a rational system, as is implied by consolidating the works connected with the removal of refuse, and of flood or land waters, under one administration. So long as London retained large open spaces near the densely-peopled parts, it was, so to speak, possible to retain a defective organization of its sanatory conditions; but the enormous development of the town has so entirely modified the very climate of the central portions, that it had become imperative upon the legislature to remedy the evils of omission produced by the previously existing want of concentration.

For the future it will be the duty of the Metropolitan Commission of Sewers to see that no houses be constructed without a proper provision for the removal of the peculiar sources of nuisances above described. They will be called upon also to provide the means of removing all the waters flowing from the several enumerated sources, in such a manner, and to such a distance, as to guarantee the public health from any inconvenience from them. Works of this comprehensive character must inevitably require long and anxious deliberation. To provide for the real wants of a town like London (the largest in the world, and whose inhabitants, as a general rule, are the most fastidiously clean, at the same time that they are the most jealous of their individual liberty of action) is a task surrounded by difficulties of an order only to be understood by those who have practically felt them. The absence of all complete statistical information, and even of a general map of the district, has complicated the whole question to an astonishing degree. But it would appear that the main principles of the general system to be followed are definitively settled, and even that considerable portions of the works comprehended in it are already in process of execution.

With respect to the working details of the Commission it may suffice to say that the regular meetings of the board for the transaction of current business, and the confirmation of the by-laws passed at the special meetings, are held once a month; it being at the discretion of the board to adjourn the meetings to such periods as they may think necessary. Any important public business or new law affecting the extra-urban district, or any works connected with the city and its liberties, can only be discussed at special meetings called for those particular purposes, and of which due notice is required to be given. The General Board is empowered to nominate committees for the purpose of transacting such business as they may judge likely to be more satisfactorily managed by such smaller bodies; the numbers of these committees, and of the members required to constitute a quorum, are also under the control of the board. The proceedings of the committees are, however, bound to be submitted to the Court of Sewers, from time to time, for their approval.

The secretary, treasurer, engineer, clerks, collectors of rates, and the respective sub-agents in the different departments, are under the ultimate control of the board.

The expense of the operations of the Metropolitan Sewers Commission is met by rates levied almost at the discretion of the Commissioners. They are empowered to divide the town into districts, "and to levy on each a 'District Sewers Rate' in respect of such portion as in the judgment of such Commissioners should be borne by such separate sewerage district, of the expense of repairing, cleansing, and maintaining in effective action, the sewers already made and completed, and which from time to time shall be made and completed within the limits of the Commission." A maximum rate of one shilling in the pound per annum of the net annual value of the property is, however, fixed by the act. But it may be doubted, from the wording of the next clause, whether it be not lawful for the Commissioners to levy any rate they may think proper for the payment of such works as are of universal utility to the whole series of districts. The limitation in fact only extends or applies to the amount of the rate to be levied for local purposes; nor does there appear to be any appeal from the decision of the Commissioners in these ratings.

Any works executed in a particular street or place not co-extensive with any separate sewerage district, may, according to the judgment of the board, give rise to a "special rate," the amount and mode of levying which they fix without appeal. They are also empowered to levy "an improvement rate," which, by a singular irony, is fixed at a maximum of ten per cent. on the rack rent, in respect of works they may judge to be of private benefit.

The whole of this portion of the machinery of the new act is so arbitrary and unconstitutional that it is not possible that its duration can be great. Englishmen have no love of taxation, either for local or for general purposes. They may submit, grumbling the while, to pay when they find it necessary, and so long as they have some control over the parties levying the amount to be expended. But it is monstrous to suppose that they should long tolerate a system by which a body, however eminent, named by royal commission, and in no wise emanating from the public, is empowered to raise any amount of money, and in any proportion it may deem advisable, without appeal to another independent authority. Local boards hitherto have doubtlessly produced very incomplete anomalous results; much of the old system required change. But to place such powers in the hands of an irresponsible body is a course evidently open to objections so serious and so just as to lead us to anticipate a revision, at any rate, of this portion of the new mode of conducting these affairs. It is unfortunate that the prejudices of our public, already absurdly alarmed against the concentration of business of a general character, should have been afforded so strong a justification as has been given in the present instance.

It is true that auditors are appointed, or at least that the power of appointing auditors exists with the Secretary of State; and that the accounts of the Commissioners are bound to be presented to parliament every year. But these provisions are in fact illusory, for no remedy exists in case the auditors refuse to pass the accounts; and parliament rarely interferes in matters of such purely local interest as these.

We conclude our general observations on the subject of the London sewers by stating that the value of the property in the district comprehended within the limits of the Commission is assessed at no less a rental than 12,186,000*l.*; and that the average amount of the rates levied by the ancient local commissions was about 65,000*l.* per annum. We may add that the composition of the existing board is as follows:

Twelve commissioners, named by the Secretary of State for the Home Department for the term of two years, revocable at pleasure; and the "ex officio" commissioners for the city.

One secretary, and one chief clerk, to transact the general business of the board.

One accountant, and one surveyor's accountant.

One clerk of the rates.

One engineer in chief, and nine district surveyors.

One crier, and the requisite subordinate clerks in the different departments.

The Commissioners are not paid for their services; all the other parties employed are of course paid.

The definite plan proposed for the approbation of the board, for the perfected sewerage of the metropolis, has at length been propounded.

It consists mainly in the practical recognition of the principle that none of the London sewage should be poured into the river within such a distance as to allow the ebb or flow of the tide to retain it near the densely-peopled districts.

After a very elaborate survey, which has extended to no less than 700 miles of covered sewers, Mr. Forster has been led to classify the general arrangements:—Firstly, into the two great natural divisions of London on the north and London on the south side of the Thames. On the north side it is proposed to intercept the whole of the existing sewers before they fall into the river, by means of two main intercepting sewers, the first at a level such as to allow of the flow of the water by gravitation, and the second at such a level as to meet the outfalls of the lowest sewers. The directions of these intercepting lines are to be made to converge to a point on the eastern bank of the river Lea, where a pumping station is to be erected, and the waters from the low-level sewers are to be raised to the upper one, a height of about 47 feet. From thence the united sewers will flow to a reservoir near Galleon's Reach; and, unless employed for agricultural purposes, the sewage water will there be discharged at such period of the tide as to prevent its reflux to London.

A somewhat similar system will be adopted on the south side of the Thames, where it is proposed to form one main intercepting sewer; but, owing to the physical configuration of this part of the town, none of the water will flow away entirely by gravitation. There will be a pumping station on the banks of the Ravensbourne, to raise the water about 25 feet, and a second pumping station to raise the water from the continued sewer into the reservoir, in Woolwich Marsh, which is to receive it during the intervals of the tides. The waters are to be discharged into the river at the last-named point.

The total length of the main high-level sewer on the north side of the town is proposed to be not less than 19 miles 106 yards, including its principal branches. That of the low-level sewer is proposed to be about 14 miles 1051 yards; and the extension to the reservoirs near Barking is to be about 4 miles long; making a total of intercepting sewer not less than 37 miles 1607 yards long, draining an area of about 41½ square miles, of which about 25½ will be discharged by gravitation, and the remainder by pumping.

The main sewer on the south side will be of nearly equally colossal proportions; for its total length is proposed to be about 13 miles 3 furlongs, including the main trunk drain of about 2 miles long, and the respective branches. The area to be relieved is about proportionate to the length of the drain; but the steam power employed will be proportionally greater upon the southern than upon the northern side.

The estimated cost of these works is about 1,250,000*l.* for those upon the north of the Thames, and about 250,000*l.* for those upon the south. Compensations for land have not been included in either case; and, from the necessarily great amount of contingencies attending these works, it is hardly likely that any estimate can much be relied on. Nevertheless, even if the cost of the works should exceed the amounts stated, unquestionably the end proposed, viz. the purification of the Thames, may be considered cheaply purchased at a greatly-increased outlay. Mr. Forster's plan, regarded as a whole, deals in a philosophical and comprehensive manner with the difficulties of the case; and, when completed, may well challenge comparison with any work of a similar nature executed in either ancient or modern times.

STATUARY.

COLUMNS in London, as monuments to commemorate great events and great persons, are only three in number; of obelisks there are three; of statues there are several, of which the description will be found to follow. Of columns, a noble achievement of art and of the genius of the man who was its designer and constructor—Sir Christopher Wren, the first in order of time is erected on the site where stood the ancient church of St. Margaret's, before the fire of London, 1666, in Fish Street Hill, and 202 ft. from the house in Pudding Lane in which the fire originated. This beautiful monument of art is a fluted column of the Doric order, erected in pursuance of an Act of Parliament, in commemoration of the conflagration and rebuilding of the city and its public edifices. The column stands on a Palladian pedestal of about 21 ft. square, the plinth being 27 ft. Its entire height from the pavement is 202 ft., which is nearly 30 ft. higher than that of Antoninus, at Rome; and is not only the highest, but also the finest isolated column in the world. Its bottom diameter on the upper part of the base is 15 ft., and contains in its shaft a staircase of black marble, consisting of 345 steps; on the abacus is a balcony, encompassing a moulded cylinder, which supports a blazing urn of gilt bronze, of 42 ft. in height. The basso rilievo, on the west side or front of the pedestal representing the king affording protection to the desolated city, and freedom to its rebuilders, inhabitants, &c., is sculptured in a rude style, by Cibber; the four dragons at the four angles, by Edward Pierce. The other three sides of the pedestal are covered with inscriptions in Latin; that on the north side describes the conflagration of the metropolis; that on the south its restoration; and that on the east the years in which, and the persons under whom the works were commenced, continued, and brought to perfection. The whole structure was erected between the years 1671 and 1677, for the sum of 13,700*l.* It is one of the sights of London, for visitors, who have admittance for sixpence each person, from 9 o'clock a. m., till dark.

Secondly, the monument to commemorate the late Duke of York, erected at the expense of 25,000*l.*, by his friends, is situated in the opening in Carlton Gardens, on the site of Carlton Palace, at the end of Waterloo Place, adjacent to the steps leading into St. James's Park. It is a most imposing structure, whether viewed from the Park or from Regent Street.

This column, of the Tuscan order, surmounted by a statue, in military costume, of the late Duke of York, is 94 ft. 4 in. in height, including the base and capital; the inferior diameter is 10 ft. 1¾ in., and the lower diameter is 11 ft. 7½ in., so that the proportion of the column is fully eight diameters. The acroter is 12 ft. 6 in. in height, and consists of seven courses, forming at once a covering to the staircase and a pedestal for the statue to stand on. The upper lead of the abacus (on the outer edge of which is fixed a plain substantial iron railing), forms a gallery, to which there are ascending winding stairs, and from which are obtained delightful views: it is open to the public upon the payment of sixpence. The stairs consist of 168 steps, of 2 ft. 4 in.: each course in the shaft is the height of five steps, and these five steps in one course are placed alternately at right angles to those of the preceding course; so, the four stones, each containing four steps, form one complete round of the staircase. Mr. Benj. Wyatt, architect, and Mr. Nowell, of Pimlico, the mason and contractor.

Thirdly, the monument to the immortal Nelson. The name of Nelson is ever endearing and enduring with Englishmen. The Emperor of all the Russias, when in London, most handsomely subscribed largely to its commemoration, yet it was not till after much cold consideration, and a beggarly subscription, that a supine Government tardily determined that the site of this monument should be the square now called Trafalgar Square, an admirable situation, having for its frontage Charing Cross, and for its back ground the National Gallery. It is a fluted granite Corinthian column, and capital, cast in gun-metal, 176 ft. 6 in. in the whole height, surmounted with a colossal statue of 18 ft. in height, executed in bronze by Mr. E. H. Baily, sculptor; the column designed by Mr. Railton, architect. The square pedestal is 36 ft. in height, and is of beautiful proportion, the four sides of which, when completed, will have in basso rilievo Nelson's four great battles, cast in the gun-metal taken in his fights from the enemy; viz., the battles of Aboukir or the Nile, St. Vincent, Copenhagen, and Trafalgar. These designs, three of which have been already executed, will be splendid examples of sculptured art; the front is by Mr. Carew, sculptor; and the obverse by Mr. Woodington. The east side has just been executed; the other is in progress.

OBELISKS.—There are two obelisks at the foot of Ludgate Hill and Fleet Street, to the memory of two popular representatives, Alderman John Wilkes, M.P., and Alderman Robert Waithman, M.P.; and a third, in the Blackfriars Road, or in the centre where five roads meet, was erected in 1771, in honour of Brass Crosby, Esq., Lord Mayor of London, who was confined in the Tower for releasing a prisoner, seized contrary to law, by the House of Commons, and for committing the messenger of the House to prison. This obelisk has inscribed upon it the measured distance from points in the city of London.

STATUES.—The statues in London are, in comparison with those of many other cities on the Continent, in some cases of very inferior description; yet there are many deserving a passing notice. The equestrian statue of Charles the First is a beautiful object, not only for its perfectness in cast, but for its historical recollections and its very admirable situation at Charing Cross. The artist of this statue was Hubert le Soeur, a pupil of John of Bologna, who cast and executed it for the Earl of Arundel, in 1633. Subsequently, during the civil wars, it was seized and sold to John River, a brazier, in Holborn, for metal to break up. The brazier, possibly an ardent admirer of art, or having a knowledge of its value, buried it, and deceived the officers of Government by shewing them broken pieces of other metal. At the Restoration, the statue was restored and placed where it is now to be seen. The statue of James the Second, in Whitehall Court Yard, back of the Banqueting-house, is the work of Grinling Gibbons, and was placed there Dec. 31, 1688, at the charge of Tobias Rustat; the king is pointing with the fore-finger to the site of his own former palace. It is an admirable specimen of the works of that renowned artist. The attitude is fine, the manner free and easy, the execution finished and perfect, and the expression of the face inimitable. In the north-east angle of Trafalgar Square is placed the equestrian statue of George the Fourth, by Sir Francis Chantrey, for which he was paid 9000 guineas. This, like most of the works of this artist, is a fine example of sculptured art. Further to the west, in the open space between Cockspur Street and Pall Mall East, is an equestrian statue of George the Third, which, although a perfect likeness of the king, is not generally admired, on account of its costume. It was executed by Mr. Matthew Wyatt. In the open space opposite the New Palace at Westminster, is the bronze statue of the Right Hon. George Canning, by Sir R. Westmacott, well executed, at a cost of 7000*l*. It is of colossal size, and appropriately placed near the Senate-house, in which he so much distinguished himself. In Westminster Abbey there are some monumental statues by Scheemakers and Rysbach, which are elsewhere described. Close by, in Queen's Square, Westminster, is a statue of Queen Anne, a quaint statue of the old school. In Hanover Square is the bronze statue of William Pitt, by Sir Francis Chantrey, erected in 1831, at a cost of 7000*l*. In Hyde Park, near Apsley House, is the splendid and celebrated statue of Achilles, inscribed by the women of England to the Duke of Wellington and his brave companions in arms, erected on the 18th of June, 1822, cast by Sir R. Westmacott, from cannon taken in the battles of Salamanca, Vittoria, Toulouse, and Waterloo. The cost was defrayed by a subscription of 10,000*l*., raised among the ladies. The design is from one of the antiques on the Monte Cavallo, at Rome, and is considered by foreigners, who appreciate this art more than ourselves, a most successful and accomplished production. Opposite the entrance to Hyde Park, is the noble Gate erected by Mr. Decimus Burton, upon which is an extraordinarily fine work of art, by Mr. Matthew Wyatt, cast in gun metal, the equestrian statue of the Duke of Wellington, erected by public subscription at a cost of 36,000*l*. The propriety of this position for so noble a monument is questioned architecturally (see p. 705). In Soho Square there is a bronze statue ascribed to Charles the Second; some antiquaries have claimed it as the statue of the unfortunate Duke of Monmouth. In St. James's Square is a statue of William the Third. Another of the same monarch is in the Bank of England, in whose reign the Bank was founded. In the court yard of the Royal Exchange is a statue of Her present Majesty, by Lough, an eminent artist; but it is considered by some as not conveying that delicacy and feminine beauty which are so conspicuous in our illustrious Queen: Sir Richard Whittingham, by Carew; Sir Thos. Gresham, by Behnes; Sir Hugh Myddleton, and Queen Elizabeth, by Messrs. Joseph, Carew, and Watson. Fronting the Royal Exchange is the equestrian statue of the Duke of Wellington; though ill placed, it is a very fine production. In King William Street, facing London Bridge, is the statue of King William the Fourth; rude, but beautifully executed, by Nixon. It is 15 ft. 3 in. in height, is formed of two blocks, and is, with its pedestal, in fine proportion. The weight of the whole is said to be 20 tons. There is a statue of Sir William Walworth, by Edward Pierce, in Fishmongers' Hall, London Bridge. Marble busts of the Kings George the Third, George the Fourth, and William the Fourth, very beautifully executed, by Sir Francis Chantrey, are placed in Goldsmiths' Hall. In the front of St. Paul's is a statue of Queen Anne. Again, going west, is the equestrian statue of George the First (if not removed), in Leicester Square. Also an equestrian statue of George the First, by Van Nost, in Grosvenor Square; of George the Second, in Golden Square; of the Duke of Cumberland (George the Second's brother), in Cavendish Square. There is a remarkably fine statue of Sir Hans Sloane, by Rysbach, in the Apothecaries' Gardens, Chelsea. In the front of the court of Somerset House, is the sculpture composition of Bacon, a recumbent figure of Thames, and, in the upper part, a statue of George the Third. Facing the Crescent, in Portland Place, is the statue of the Duke of Kent, the father of the present Queen, by Gahagan. There is a bronze statue of Francis, Duke of Bedford, 27 ft. in height, in Russell Square, facing Bedford Place; and in Bloomsbury Square, facing the end of the same Place, Charles James Fox, in a sitting posture; both by Sir Richard Westmacott. In Burton Crescent is the bronze seated figure of Major Cartwright, the venerable reformer, by Mr. Clarke, of Birmingham. There are statues of James the First and his Queen, and Charles the First and Second, in the niches of the Temple Bar; the Gate built by Sir Christopher Wren. Queen Elizabeth, in front of St. Dunstan's Church. In Queen Square, Bloomsbury, a statue of Queen Anne. There is also a bronze statue, by Scheemakers, of Guy, the founder of the hospital in Southwark bearing his name, a fine work of art. There are others of various character in the several squares not mentioned; but we must not omit to mention an admirable statue in a kneeling position, of the Moor, in Clement's Inn.

The sculpture in Guildhall is worthy of a visit; viz. pyramidal monument to Lord Chatham, by Bacon; monument to the Right Hon. William Pitt, by Bubb; monument to Lord Nelson, by Smith; monument to Alderman Beckford, by Moore; also statues of Edward the Sixth, Queen Elizabeth, and Charles the First. In the Council Chamber of Guildhall is Chantrey's first statue of George the Third; a bust of Granville Sharp, also by Chantrey; and a bust of Lord Nelson, by Mrs. Damer.

The monumental sculpture in the Rolls Chapel is curious. 1. Monument to Sir Richard Allington, 1561. 2. Monument (very fine) by Torrigiano, of Dr. John Young, Master of the Rolls in the time of Henry the Eighth. Torrigiano was sculptor to Henry the Seventh, and was employed by that monarch on the fine sculpture in that great work of art. 3. Monument to Lord Bruce, of Kilross, 1610, Master of the Rolls in the reign of James the First. Also, within a recess, a head of Christ, with an angel's head on each side. No mention is made here of statuary monumental sculptures, which are, to a considerable and interesting extent, to be seen within St. Paul's Cathedral and the Abbey Church of Westminster. An account of them will be found under the descriptions of those buildings.

Inscriptions and Outdoor Monuments.—There is a great deficiency of commemorations of men of eminence, in the public streets, and few outdoor monuments in the shape of tablets and inscriptions. Those most to be noticed, are, London Stone, against St. Swithin's Church, Cannon Street; tablet, in Panyer Alley, Newgate Street; tablet to Milton, against the external wall of the Church of Allhallows, in Bread Street, Cheapside; a stone at the corner of Cock Lane, formerly Pye Corner, where the great fire of London ended; a tablet in Bullhead Court, Newgate Street, of King James's Porter and Dwarf; the original sign of the Leathern Bottle, over Hoare's Bank, in Fleet Street: in Cheapside there are three houses, having their original signs affixed to the fronts and let in the brickwork; No. 37, Cheapside, has the original sign of the Goose; No. 39, the Unicorn; and No. 77, the Seven Stars.

STEAM NAVIGATION ON THE THAMES.

The subject of Steam Navigation is a most important one for all civilised and maritime nations, the more so on account of those considerations which have direct relation to commerce, and in an especial degree to that of London. The enterprise by which so much has been accomplished belongs to the industrial inhabitants trading on the banks of the Thames; the many experiments made thereon; the large fortunes that have been sacrificed for its advancement, and the successful achievements that have, for a series of years, resulted from that determinate spirit of which the Thames has been the theatre.

It is not our purpose to dilate on its early historical records: much will be inserted in the new edition of "Tredgold on the Steam Engine."

Steam navigation, however, reached the Thames. The precursor of this now important branch of metropolitan commerce was a small vessel originally called the "Margery," fitted with engines made at Glasgow, by Cook. She was built and fitted under the superintendence of Mr. George Dodd, who originally was in the navy, and subsequently distinguished himself by his talent as an engineer and architect; and who, as the assistant of the late Mr. Rennie, had much to do with the construction of Waterloo Bridge and other great public works. The vessel was about 90 ft. long and 15 ft. beam, and drew 4½ ft. water. Her engine was 14-horse power on the side lever principle. The boiler was at the side of the engine, and there was a tube carried across the boiler, through which one of the paddle shafts worked. When complete, she made a trial trip from Glasgow to Dublin, and thence proceeded round the Land's End to London, performing the whole voyage under steam. This was in the spring of 1815; and after her name was changed to the "Thames," she plied for passengers between London and Margate for the season, and in 1816 she ran to Gravesend, and occasionally as an excursion boat. She was broken up, and her engines were ultimately employed near St. John's Wood to drive a saw-mill.

In 1816 Mr. Maudslay made the first pair of combined engines, and applied the power direct to the paddle shaft, instead of using spur gear, &c. Messrs. Boulton and Watt then commenced and carried on most extensively combined lowpressure engines, followed by Messrs. Maudslay, Field, &c., and by Messrs. Seaward, Messrs. Rennies, Messrs. Miller and Ravenshill, and many others, whose works are most convenient for the manufacture of marine engines. Messrs. John Penn and Son have subsequently carried on a most extensive business in the making of those engines known as the oscillating cylinder engines, which they have fitted into boats of large and small tonnage and power, for above and below bridge.

In steam-boat building a very extensive trade has been carried on since 1815. Mr. Ditchburn, of Blackwall, has distinguished himself by not only constructing timber vessels but iron also. Mr. Pitcher, of Northfleet, with whom Mr. Harman is now associated, had the contract for building several of the West India boats, besides other vessels, for public companies and for foreign governments. Messrs. Miller and Ravenhill, of Blackwall, built the "Prince of Wales," a fast boat, for the Margate Company, and are now building other vessels of iron. Mr. Mare, of Blackwall, has built recently, and for the Russian Government, several iron vessels, which are well spoken of. Mr. Joyce, of the Greenwich Iron Works, has recently built an iron vessel to trade as a passenger and merchant vessel from London to Boulogne. Messrs. Robinsons and Russell, Marine Engineers and Steam Ship Builders, have extensively built and are building iron vessels. They have recently built an iron yacht for Robert Stephenson, Esq., M.P., on Mr. Scott Russell's wave principle, which has attracted much notice. On both the north and south banks of the Thames the various eminent firms are extensively engaged in the construction of marine engines as well as iron and timber vessels. (See also article "Mechanical Engineers.")

The Thames has now, both below and above bridge, become the highway for the transit of passengers with economy and despatch. The serpentine course of the Thames affords most convenient communication for a distance of about 18 miles—take Richmond in the west and Woolwich in the east—by small boats, at fares varying according to distance, of 1*d.*, 2*d.*, 3*d.*, 4*d.*, and 6*d.*, landing at the several wharfs. The starting-places for either up or down the river are London Bridge, Southwark Bridge, Blackfriars Bridge, Waterloo Bridge, Hungerford Suspension Bridge, and Westminster Bridge, besides numerous other wharfs; but the stranger is advised to make the bridges his points of departure and landing. At all the wharfs may be seen large placards to direct the stranger; and the money-takers are usually civil men, who will direct the foreigner or stranger correctly for his rout. Most of those small boats have Penn's oscillating cylinder engines or Joyce's improved engines. This extensive traffic (above and below bridge) is conducted by the Waterman's Company, the Citizen Company, Woolwich and Greenwich Company, Iron Boat Company, Westminster Company, Richmond Company, and other companies of a similar description, plying at all times of the day, from 8 o'clock, A.M. to 8 o'clock, P.M. For Gravesend (the entrance to the port of London), a London and Thames watering-place, 30 miles from London, steam packets leave London Bridge Wharf, and Blackwall (Brunswick Wharf) almost every hour in the day: average of time two hours, at 1*s.* per head. These packets are most convenient: they have refreshments on board, and the power of each of the engines varies from 20 to 60 horses. In the summer several steam packets of timber and iron leave London Bridge Wharf for Margate and Ramsgate, Deal, and Dover, at 10 and 11 A.M. They are usually fine boats, and contain every convenience and accommodation, being in fact floating taverns—dinners 2*s.* In the winter only one boat plies between London, Margate, and Ramsgate daily.

Steam navigation exists to a great extent between the Port of London and most parts of the world. There are several companies and proprietary conductors of this trade. The companies consist principally of General Steam Navigation Companies: Cork Company, Dublin Company, West India Steam Navigation Company, Screw Rotterdam Company, Batavia (Dutch Company). Aberdeen Company, Levant Screw Company, Leith Company, Belgian Antwerp Company, Boulogne Commercial Company, Hull Steam Navigation Company, Ipswich Company, Red Rover and City of Canterbury Herne Bay Company, Belfast Company, St. Petersburg Company, Leith, Dundee and Perth, and Aberdeen Companies, &c.

Some of these vessels are of very large tonnage, varying in power from 40 to 160 horses each engine, each vessel being impelled by two engines.

The following are the names of the places of destination:—

Aberdeen,
Antwerp,
Belfast,
Berwick,
Boston,
Boulogne,
Calais,
Cologne,
Constantinople,
Copenhagen,
Cork,
Cowes,
Dover,
Deal,
Dublin,
Dundee,
Edinburgh,
Exeter,
Guernsey,
Hamburgh,
Havre,
Herne Bay,
Hull,
Inverness,
Ipswich,
Isle of Wight,
Jersey,
Leith,
Levant—all the Islands,
Liverpool,
Margate,
Newcastle,
Norwich,
Ostend,
Perth,
Portsmouth,
Ramsgate,
Rhine,
Rotterdam,
St. Petersburg,
Southend,
Sheerness,
Torquay,
West Indies—all the Islands,
Yarmouth.

Offices, in Moorgate Street, and several near London Bridge.

The small steam vessels that ply at places between Woolwich and Richmond are propelled by paddles, usually the ordinary ones. Those of the larger vessels trading with passengers and goods to distant places have usually the common floats, but some of them have Morgan's paddles, which are extending in use every day, being found most efficacious. Screw propelling is used by the Cork and Rotterdam Companies, the Levant Company, and the Rotterdam Screw Company.

THAMES TUNNEL.

The present is an age of unprecedented progress and invention; an age in which time and space appear to have been annihilated—in which intelligence is made to speed from one country to another with the quickness of thought or the rapidity of lightning—in which the very elements are set at defiance and made subservient to our wants—in which a difficulty has but to be encountered to be overcome, a want felt to be supplied—a century which has beheld the perfection of the steam engine, the introduction of railways and steam vessels, the discovery of the electric telegraph, the construction of the tubular bridges, and the formation of a tunnel beneath the bed of the Thames. The Thames Tunnel is indeed one amongst the wonders of this truly wonderful age.

It is now upwards of half a century since the idea of connecting the shores of the Thames by a subaqueous passage was first proposed by Ralph Dodd, the well-known engineer. The attempt was made, and failed, the whole of the funds having been spent in endeavouring to sink the shaft. Failure, however, but stimulated exertion, and in the year 1805, little more than seven years after the former attempt, a company was formed and incorporated by an Act of Parliament, under the name of the "Thames Archway Company," with the ostensible object of forming an archway or tunnel beneath the bed of the river at Limehouse, sufficiently capacious to allow of the transit of vehicles through it. Again, however, for a season their efforts were not to be successful, although the enterprising promoters of the scheme had secured the most talented and experienced engineers in the persons of Mr. Vazie and Mr. Trevithick, under whose immediate superintendence the works were commenced, and carried on with such spirit and perseverance that, although many difficulties delayed their progress, and repeatedly threatened the destruction of their hopes, they succeeded in sinking a shaft on the Surrey shore, and carrying therefrom a driftway under the river's bed to within about 200 ft. of the opposite shore. At length, however, on the 26th of January, 1808, the river broke in upon the works, and finally defeated their endeavours. Interesting in the extreme would be the account of this enterprising undertaking, did space allow us to do more than just to mention its having been attempted.

It was in the year 1814 that the attention of Sir Isambart Brunel was directed to the subject, and that by mere accident; he was at that time engaged at Chatham, in the construction of the machinery which has since deservedly excited such general admiration for the combined beauty and simplicity of its mechanical arrangement, and, amongst other works, had just completed a small tunnel or driftway for the conveyance of timber from the Medway to the saw mills at the back of the dockyard. In passing one day through the yard, he observed a portion of the keel of a vessel, which, having been sawn longitudinally, exposed to view the perforations of a sea worm well known by the name of the 'Teredo Navalis.' He passed on, but the thought occurred to him that these insects had made diminutive *tunnels;* he immediately returned, and then remarked, with the greatest interest, the manner in which they had bored through the wood by means of an auger-formed head—how, when the excavation was effected, the sides were secured and rendered impervious to water by a calcareous secretion with which the insect lines its passage—and how carefully too near an approach to the water had been avoided.

Sir Isambart's active and ever ready mind soon fertilized the first crude idea which Nature had lent to him; and, within a short time, he had contrived a mode of forming subaqueous tunnels, by the instrumentality of a huge iron 'teredo.' Of this plan—the embryo of the Thames Tunnel—we cannot resist giving a brief sketch. Referring to the annexed woodcuts, the circular framing E E represents the body of the worm, with its auger-formed head A D, closely resembling in form the tool employed by carpenters for boring wood; this instrument, being turned round upon a large hollow axis C B, bored its way through the ground, which was removed by the miners, as shown in figure 4. As the worm advanced, leaving a space F F, figure 3, small plates of cast-iron were introduced, and the whole was intended to be afterwards lined with brickwork, as shown in figures 1 and 2.

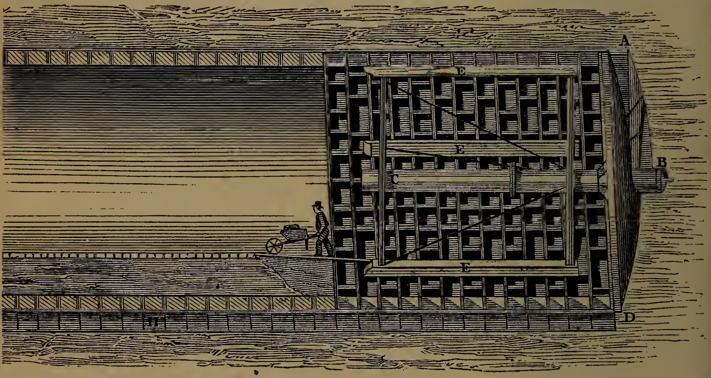

FIG. 1.

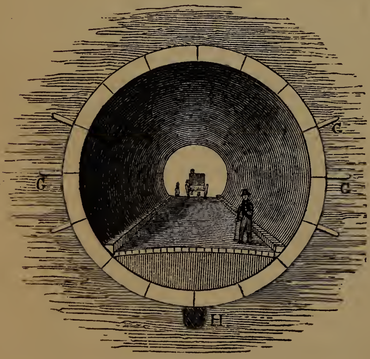

FIG. 2.

Several years elapsed before Sir Isambart brought his plan forward, and it was not until the year 1823 that he exerted himself in the formation of a company for forming a tunnel beneath the Thames at Rotherhithe. In this interval he had materially modified his plan, having given up the idea of turning the iron 'shield' or 'worm' upon its axis, fearing the resistance, which he anticipated would be occasioned by the friction of the ground against its sides, and had divided it into four distinct frames, which could be separately advanced. Subsequently he substituted the rectangular for the circular form, considering that in horizontal strata, varying in consistency and firmness, a more uniform pressure would be sustained by the former than by the latter.

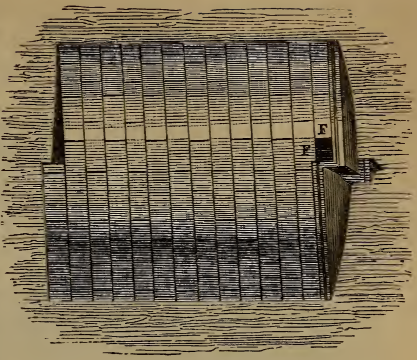

Fig. 3.

The Act incorporating the company received the royal assent in June, 1824; but in consequence of a dispute relative to the property required for the site of the Rotherhithe shaft, the works were not actually commenced until the middle of February, 1825.

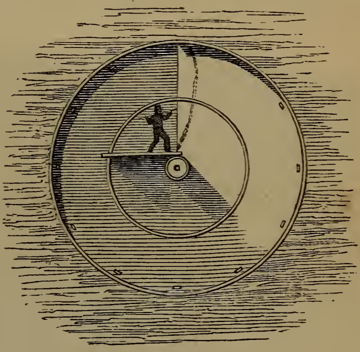

Fig. 4.

A transverse section of the tunnel, as executed, is given in figure 5, which shows not only its external and internal form, but also the disposition of the bricks of which it is composed; this section is taken through the centre of the tunnel, in the deepest part of the river, and shows the strata passed through in their natural order, and the relative positions of the high and low water lines, the bed of the river, and the top of the tunnel. Two archways running parallel side by side, possess advantages over one single tunnel, where a continuous traffic of vehicles in both directions may be expected; and especially in the present instance, in which peculiar circumstances limited the height of the tunnel, namely, the contiguity of the bed of the river above, and the existence of an extensive quicksand, only a few feet below the level of its invert; a quicksand of so dangerous a character, that Sir Isambart was repeatedly warned by eminent geologists, to keep the foundation of the tunnel as high as possible, and the accuracy of whose opinion was fully confirmed by subsequent experience. Between these two archways, at intervals of eighteen feet, doorways, or cross-archways are formed, affording the means of frequent communication, presenting a peculiarly pleasing feature, and adding materially to the architectural effect.

Since the opening of the tunnel, many of these archways have been fitted up as stalls or shops.

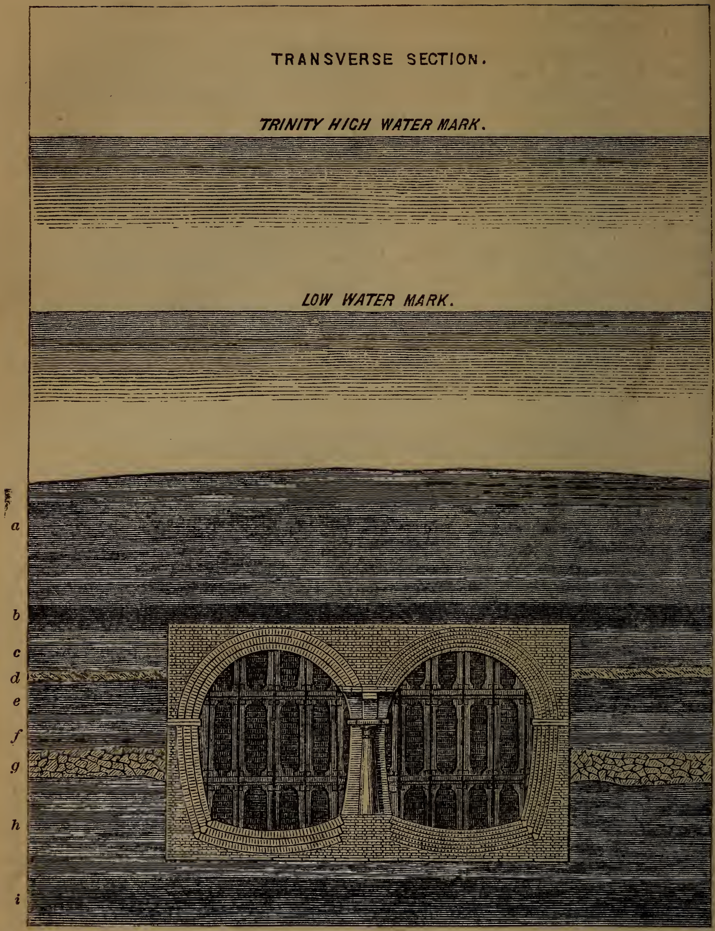

Fig. 5.

The external dimensions of the brickwork of the tunnel are 37 ft 6 in. in width, and 22 ft. in height; the thickness of the brickwork at the crown of the arch is 2 ft. 6 in., and the same at the lowest point of the invert. The external piers are each 3 ft. thick on the springing line of the arches, and the centre pier is 3 ft. 6 in. The archways are each 14 ft. wide, and 17 ft. in extreme height; the upper portion is semicircular, and the invert and sides are segmental in form; the invert is laid upon 3-inch elm planking. The number of bricks in every foot in length of the tunnel is about 6000; their arrangement is shown in the section (figure 5); the brickwork was built in successive additions (or rings as they were termed), sometimes a whole brick, and at other times only half a brick in thickness, the completion of each ring presenting a perfectly plain face, no bond whatever being employed between the successive rings. The right-hand half of the figure exhibits the mode in which the bricks were laid when working in 9-inch rings, and the left-hand half shows the arrangement when half brick, or 4½ inch work was employed. The tunnel is built entirely with the hardest picked stock bricks, laid in cement, the first or inner ring of the arch being laid in pure cement, and the other portions of the work in half cement and half clean sharp sand. The bricks for the semicircular portion of the arch were moulded on purpose for the work to the true wedge form, so that the bricks radiated with parallel joints between them. The total length of the tunnel is 1200 ft.

The centre wall, which divides the two archways from each other, was built entirely solid, and the cross-archways, which we have described as being formed at frequent intervals between them, were afterwards cut through the solid wall; the upper portion being sufficiently cut away to allow of a semicircular arch 9 inches in depth being turned, to which the old work was made good in cement. Figure 6 is a longitudinal section of a small portion of one archway of the tunnel, looking towards the other one, and showing these cross-arches of communication.

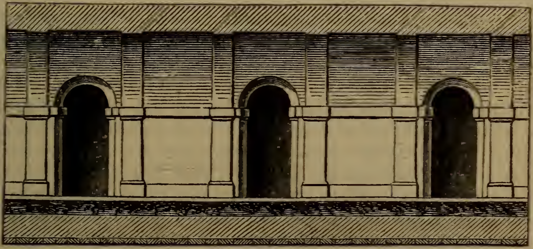

Fig. 6.

The strata shown in figure 5 are in their natural positions, as they would have been found had they not been disturbed; but the ground was so much broken up and deranged by the progress of the shield, that the strata were seldom met with in the positions and with the regularity here shown: *a* is a stratum of sand, gravel, mud, and river deposits; *b*, a bed of clay of a reddish brown colour; *c*, a stratum of clay mixed with silt; *d*, a thin layer of silt very full of shells; *e*, a stratum of stiff blue clay; *f*, a bed of clay of a more mottled character, containing a portion of silt, and a number of shells; *g*, a stratum of indurated clay, which at times was so hard as to require wedges to break it up; *h*, a bed of gravel and sand of a green colour; and *i*, a similar stratum, but somewhat coarser.

The shield or machine by the instrumentality of which the tunnel was effected next claims our notice; brief, indeed, as it must be, and inadequate to describe those beautiful mechanical contrivances which were prepared to meet and overcome every possible difficulty to which the work was contingent. Let us conceive a huge mass of machinery, composed entirely of iron, 37 ft. 6 in. in width, 22 ft. in height, about 8 ft. in depth, and weighing upwards of 200 tons, presenting in front a close dense surface of timber, composed of 528 separate boards, and on the top and sides a similar close surface of metal, formed by plates overlaying the brickwork of the tunnel behind, and entering the ground in advance of the front timber surface; while the back of the shield next the tunnel itelf was open, and afforded ready access to the miners, by whom its movements were controlled. The interior mechanism of the shield was divided into twelve distinct or separate parts, termed frames, each about 3 ft. in width, which stood side by side, very much like volumes ranged on the shelves of a bookcase, within the space which we have above described as being occupied by the shield. Each of these frames was again divided into three stories in height, by the introduction of iron floor-plates, so that the whole shield contained thirty-six small cells or *boxes* (as they were technically termed), sufficiently large to enable one man to work within them, but not presenting a larger surface of ground in front than under ordinary circumstances one man could attend to. In figure 5 we have shown the shield as it appeared when viewed from the tunnel, the division into 'frames' and 'boxes,' which we have above described, being there very clearly seen: these frames were numbered consecutively from left to right, for facility of reference.

It will at once be seen how admirably the shield was adapted for the duties which it had to perform; the chief of these was obviously to support the ground, but a quality equally essential was the power of being easily advanced or moved forward, as the tunnel progressed. Now, by its division into frames, these two objects were at once attained, for the whole was so contrived that while six alternate frames were engaged in sustaining the pressure of the ground, the six intermediate frames were relieved entirely from all pressure, and left free to be moved forward without resistance. These, in their turn, then became the pressure-bearers, relieving those which had previously relieved them in a similar manner, and enabling them to be advanced without difficulty.

"It has been already said that the shield, as first designed by Sir Isambart, bore a considerable resemblance to the worm, from which the first idea was derived; but the present shield has much more aptly been compared with a man, to whom, in its general organisation, each of these 'frames' or divisions bears a resemblance; having legs with both a knee and ankle-joint, with which it alternately steps or walks on in advance of the brick structure; arms, with which it supports and steadies itself, or lends assistance to its neighbours when they require it; and a head, for supporting the superincumbent earth, which can be raised or depressed, or altered in its direction, as circumstances may require."*

Figure 7 affords a view of the three left-hand frames of the shield, as seen from the tunnel, the third frame being shown in section, in order that the mechanism may be more clearly seen; and figure 8 is a section taken through the same frame, in a line parallel with the direction of the tunnel, or perpendicular to that shown in figure 7. The sides of the boxes, or frames, are formed by strong castings A A, securely bolted to the floor-plates B B, which, as already explained, served to separate every frame into three stories, or boxes. The middle boxes were stiffened, both transversely and longitudinally, by wrought-iron stays or struts, C C and D D; and the shield was strengthened at the back by two

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* A Memoir of the Thames Tunnel, in Weale's Quarterly Papers on Engineering.

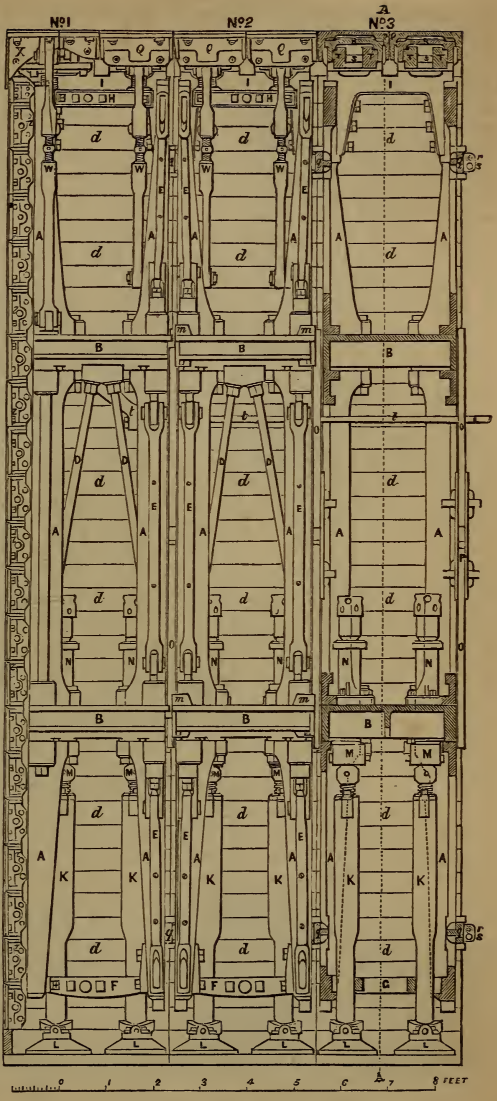

FIG. 7.

wrought-iron straps E E, which extended from the top to the bottom of both sides of each frame, passing through the intermediate floor-plates. The framings of the upper and lower boxes were sloped away at the back, as shown in figure 8, to allow more room for the bricklayers in putting in the brickwork. The lower part of the bottom box was secured by a wrought-iron stay or framing, F and G, and the upper part of the top box by two similar framings of wrought iron, H and I. Each frame was supported upon two long jack-screws, K K, which, from the duty they had to perform, were termed *legs;* the lower extremities of these jacks rested upon strong wrought-iron plates L L, termed *shoes*, whose object was to distribute the weight of the frames, together with the pressure of the superincumbent earth, over a larger surface or base; beneath these shoes a flooring of elm planks, 3 in. in thickness, was laid, upon which the brickwork of the tunnel was built, after the ground beneath them had been compressed by the weight of the shield passing over them. The leg was attached to the shoe by a species of ankle-joint *e*, resembling in principle the method adopted for mounting mariners' compasses, which allowed the shoe to adjust itself readily to any

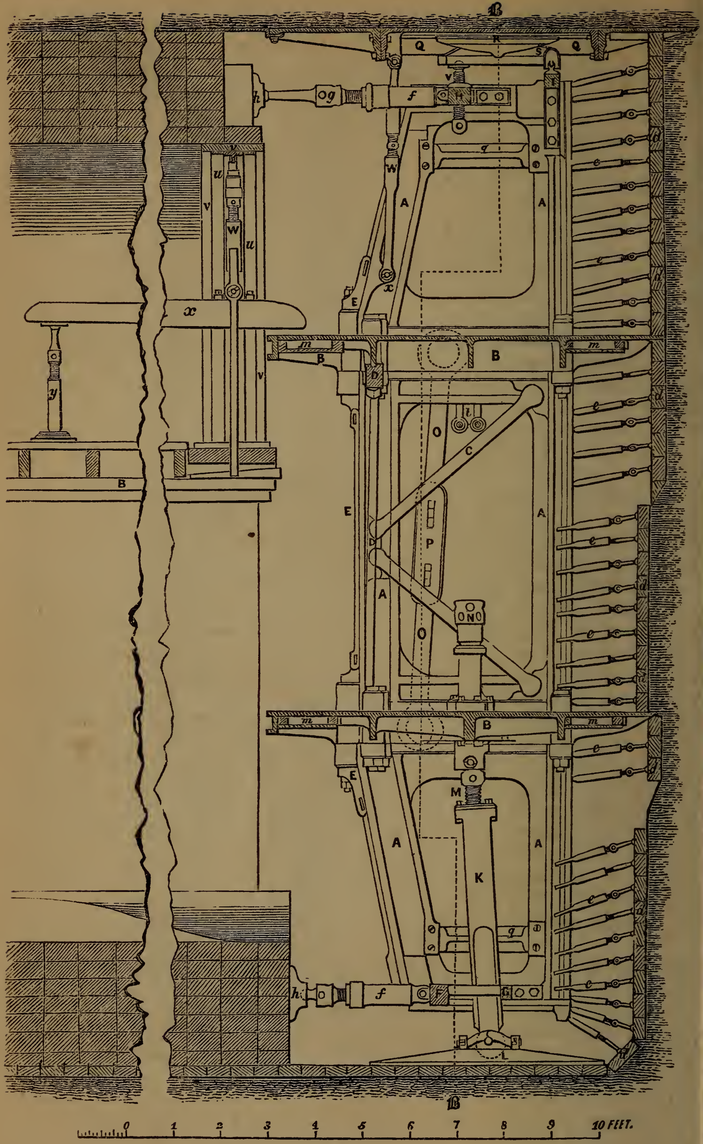
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Fig. 8.

inequality in the ground. At the upper part of the leg was the knee-joint M, about which it turned in the act of stepping forward: the length of the leg could be varied at pleasure, by means of the screw at M, turned by the capstan-head at M, and a second auxiliary one in the middle box N.

The frames were also provided with slings, or arms, O, consisting of strong wrought-iron bars, attached at their upper extremities to the floor-plates of the odd numbered frames, and at their lower extremities to the floor-plates of the even numbered frames; the attachment consisting in an eye fitting to a circular pin projecting from the side of the floor-plates, so as to allow a freedom of motion about these pins as a centre. The upper and lower extremities of the slings consisted of two separate bars of metal connected by two plates or cheeks, one on either side, through which, and the slings themselves, metal keys or wedges passed, by the tightening up or driving back of which, the length of the slings could be increased or diminished at pleasure. The use of these slings was to enable one frame to *derive* support from its neighbour on either side, or, in its turn, to *afford* support to either of its neighbours. Thus, if one of the odd-numbered frames, in which the upper extremity of the slings were attached to the top floor-plates was required to be supported independently of the legs, it was only requisite to tighten up the wedges and lengthen the slings to raise the frame, and relieve the legs entirely from pressure; the slings, in this case, *pushing up* the frame. While in the case of an even-numbered frame, by driving back the wedges of the slings on either side, and so lessening their length, the frame would be *drawn up*, and the legs relieved from the office of supporting the weight of the frame.

The ground over the roof of each frame was supported by two plates of metal Q Q, the tails of which always overlaid the brickwork, as shown in figure 8, and the points entered the ground some distance in advance of the boards, by which the front of the shield was secured. These plates of metal (which were technically termed *staves*) were supported upon a cast-iron saddle piece R, resting upon a swivel S, which latter being supported in front upon a kind of joint U, and at the back upon a jack or strong screw V, could be raised or lowered at pleasure. This mode of supporting the top staves allowed of their being brought into any position, or having any direction given to them. The tails of the staves were supported by a powerful jack-screw W.

The sides of the shield were secured, and the ground supported by a number of similar staves, Z Z Z, figure 7, attached to the frames by a sliding bar, passing through a block secured to the sides of the external frames, in such a way as to allow of their direction being altered as circumstances might require. The tails of the side staves overlapped the brickwork of the tunnel in the same manner as the top staves.

The ground in front of the shield, as we have already mentioned, was supported by small boards of wood *d d*, termed *poling boards;* each frame had its own set of *polings*, their length corresponding with the width of the frames. These boards were 3 in. in thickness, 6 in. in width, and at each end had small iron plates let in containing a recess, into which the head of a small jack *e e* (termed the poling screws) fitted; the other end of these screws, resting in recesses formed for them, n the front rail of the cast-iron framing A A, composing the sides of each box.

The frames of the shield were not in actual contact, a space of nearly 3 in. being maintained between them, to avoid the resistance which

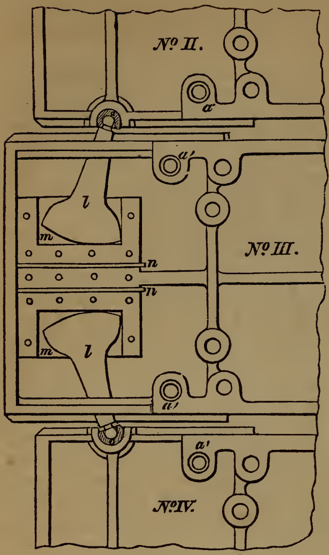

Fig. 9.

would have arisen from the friction of the frames if they had been allowed to rub against each other; and in order to preserve this space, the floor-plates of every odd-numbered frame was provided at each end with a pair of wrought-iron sectors of circles, *l l*, figure 9, (or as they were termed *quadrants*,) the heads of which bore against the floor-plates of the even-numbered frames, and the circumference of which worked in the recesses *m m*, formed in the floor-plates of the odd-numbered frames for their reception. The quadrants served only to prevent the frames approaching too close: to obviate their spreading, a powerful tie, formed by two wrought-iron bolts *t t*, was attached to the two external frames.

Each frame was supported and maintained in a vertical position by two powerful screws *f f*, figure 8, termed the *abutment* screws, one at the top and one at its lower extremity. The heads of these screws rested against iron plates *h h*, which served to throw the pressure occasioned by the screw over a larger surface of the brickwork. It was by means of these screws that the frames of the shield were advanced. The foregoing is but a very imperfect description of this immense machine; for a fuller account, illustrated by plates, showing every detail of its construction, we must refer to "Weale's Quarterly Papers on Engineering."*

We now pass on to describe the mode in which the excavation was carried on and the shield advanced. We should first state, that every alternate frame of the shield stood three inches in front of the intermediate frames, which latter, when advanced, were moved forward six inches at a time, so as then to stand (in their turn) three inches in advance of the others. Thus, the odd-numbered and even-numbered frames alternately stood in advance of each other. We shall now suppose the odd-numbered frames to be behind, and proceed to detail the method of advancing one of them (No. III.), which will sufficiently explain the process adopted in the case of any one of the rest. Figure 10 represents a sectional plan of a portion of the frames Nos. II., III., and IV., showing the relative positions of the front rails of those frames, together with their poling boards and the poling screws which supported them. This being the position of things, the first operation is to remove the poling boards of the frame No. III., one at a time, commencing at the top of the box, and, having carefully excavated or cut away the ground to a depth of three inches, to replace the poling and its two screws; but instead of resting the latter upon their own frame, as they were before, they are now placed against the front rail of the two other frames on either side, as shown in figure 11; the object of this arrangement being, that the intermediate frame, after all the poling screws have been so removed, shall be left entirely free to be advanced or moved forward without experiencing any resistance from the ground against its poling boards, the whole of which are then temporarily supported by its neighbouring frames. The frame itself is then moved forward the required distance, or six inches, by means of the large abutment screws *f f*, figure 8; the mode of operation being first to relieve the legs of the frame from weight by means of the slings, in the manner already explained, then to move forward the two shoes L L, bringing the legs into the sloping position shown in the figure (7), after which the frame itself is screwed forward by turning the upper and lower

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* It should be mentioned that two shields were employed in the construction of the tunnel. That which we have just described was the second, and contained several improvements which experience had pointed out. They were, however, identical in principle, and in their general mode of action.

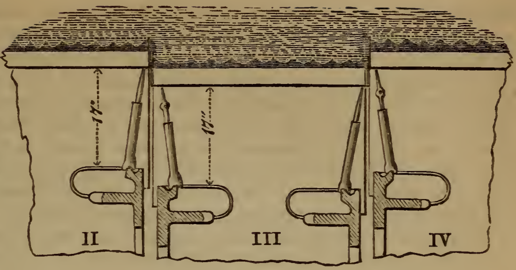

Fig. 10.

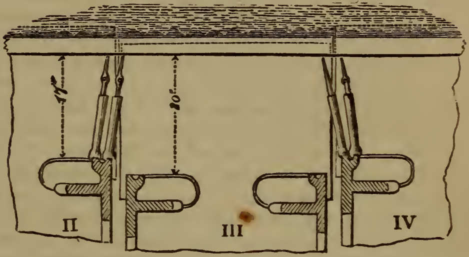

Fig. 11.

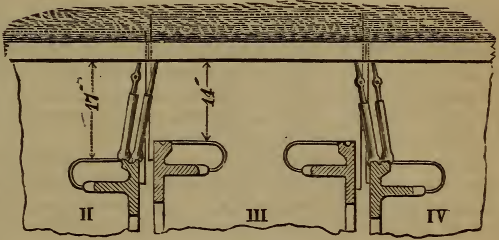

Fig. 12.

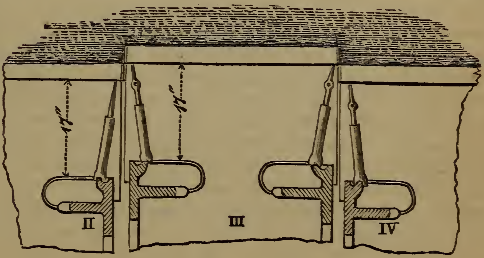

Fig. 13.

abutment screws simultaneously, until the legs are brought again into a vertical position, and the frame assumes the situation shown in figure 12, being then three inches in advance of its neighbours, Nos. II. and IV. The poling boards are now again removed, the ground once more excavated to a further depth of three inches, and the boards and poling screws again replaced, the latter being again restored to their own frame, so that they assume the position shown in figure 13, the frames and polings of the odd-numbered divisions being now three inches in advance of the even-numbered frames, which latter, in their turn, will undergo a similar operation to that above explained.

In figure 8 the polings in the upper box are shown as having been worked forward, while in the middle and lower boxes they are represented as being in the act of being worked ; in the latter, two polings are shown out at once; this was usually allowed in the lower boxes, the ground in which, being further from the river, was usually more solid than in the upper boxes, and occasionally, when the ground in the latter was unusually good, the miners in those boxes were allowed also to remove two polings at a time.

When the whole shield had thus been advanced sufficiently to admit of a ring of brickwork being introduced, this was immediately proceeded with, the arches being turned upon a narrow centering or profile *v*, figure 8, and being inserted behind the abutment-screws *ff*, one at a time, care being taken that none of the poling screws were resting upon a frame whose abutment screws were not in proper bearing. As the shield advanced, a timber stage on wheels followed it, which afforded ready means of access for the miners and bricklayers to every part of the shield.

Having thus described as fully as our limited space will allow, the mode in which the shield was employed and the tunnel itself constructed, we shall next proceed to give a short narrative of the progress of the work, and a brief account of some of the difficulties which had to be encountered, with the means resorted to in overcoming them, and in which the ingenuity and indomitable perseverance of Sir Isambard Brunel were so eminently displayed.

The necessary preliminary arrangements having been made, the operation of constructing the shaft on the Rotherhithe shore was commenced on the 16th of February, 1825 ; the foundation stone was laid on the 2nd of March, and the shaft was completed by the end of October of the same year. It was fifty feet externally in diameter, the walls being three feet in thickness to a depth of forty-five feet, this portion being built entirely of bricks laid in Roman cement, and sunk through the ground in the mode usually adopted for sinking wells ; that is, the wall was built above the ground, upon a strong cast-iron curb, having a sharp cutting edge which entered the ground, and the shaft was lowered by excavating within it to a depth of forty feet ; at this point, however, becoming earth-bound, it was found necessary to complete it by underpinning the brickwork, that is, building it downwards, as the excavation was carried down, which was not accomplished without considerable trouble, occasioned by the loose nature of the ground which had to be passed through, and the great quantity of water met with in some of the strata ; this lower portion of the wall was increased in thickness to four feet, and was built of rag stone laid in mortar, composed of Roman cement and lime together, and lined with two courses of bricks laid in cement. At a depth of eighty feet an invert was formed, and in the centre a smaller shaft twenty-five feet in diameter was sunk, to serve as a pumping well to drain the works during their progress; it was in the construction of this latter well that a confirmation was afforded of the truth of the statement already alluded to, relative to the existence of a quicksand beneath the tunnel.

On the completion of the shaft, the several pieces of the shield were lowered into it, and put together opposite to an opening which had been left in the side of the shaft, and through which the shield commenced its march in the latter part of November: its progress at first was necessarily slow, the men being as yet inexperienced in the use of its several parts.

Very little inconvenience was experienced from water after the first few weeks, until nearly the first 200 feet had been completed, after which the quantity gradually increased until in April, 1827, when rather more than 500 feet of the tunnel having been completed, it was found requisite to keep as many as forty men constantly at work to pump out the water which found its way into the shield. During the whole of this period the ground was found to be very loose, and it was only by the most constant vigilance and caution, that such steady and good progress was maintained. As, however, the shield approached the centre of the river, the nature of the ground was found to alter, and to become more and more loose, the silt and clay which had previously been met with giving place to gravel, sand, and river deposits, through which the water found its way in very large quantities. The progress at this period was, however, greater than it had been at any former period, as much as 9 ft. 3 in. in length of the tunnel having been completed in three days.

On the 1st of May, 1827, the miners struck for an increase in their wages, in consequence of which several inexperienced hands had to be taken on in their place, and the ground becoming still worse than it had previously been, some apprehensions began to be felt that an irruption of the river might occur; and after two very serious runs of loose ground, on the 8th and 11th of the same month, being successfully repelled, these apprehensions were but too certainly verified. On the 12th the influx of water in the shield was found to increase with the rise of the tide, and although every precaution was taken, about six o'clock in the morning the river broke in with overwhelming violence, and with such rapidity that the whole tunnel and shaft were filled in a very few minutes. Mr. Beamish, the engineer on duty, and the men under him had to make a hasty retreat, and narrowly escaped being overtaken by the flood.

A diving bell having been obtained, with its aid the bed of the river was examined, and it was found that a very large cavity had been formed by the rush of the water carrying the ground into the tunnel; so that a free communication existed between the river and the tunnel, the tide rising and falling simultaneously in both; the content of the ground thus displaced was estimated as being not less than 25,000 cubic feet. Immediate steps were taking for repairing this breach, by putting down tarpaulings over the hole, and filling it with bags of clay and gravel, the diving bell being employed from time to time to inspect the state of the filling. These means being found successful, the water was pumped out of the tunnel, and the shield was re-entered by Mr. Beamish on the 27th of June.

This irruption afforded strong evidence of the stability of the brickwork of the tunnel, which was found undisturbed, as well as of the efficiency of the shield, which after the severe shock it had sustained was found to be but very slightly injured.

It was not until the latter end of September that the advance of the shield was resumed, and at first the progress was very slow. The influx of water was now found to be more copious than ever, and on one occasion amounted for several hours to 1200 gallons per minute.

By the middle of January, 1828, another 50 ft. had been added to the tunnel, its total length being then about 605 ft., when on the 12th, another and more sudden irruption of the river took place, the tunnel filling with such rapidity, that of all those who were in it at the time, Mr. Brunel alone escaped, six men being drowned in different parts of the work. Mr. Brunel himself had a very narrow escape, and sustained several severe contusions, being carried up the shaft by the rush of water amidst floating timber and casks.

The injury was once more repaired in the same way as before, the hole in the bed of the river being filled with bags of clay and gravel; and by the 12th of April, exactly three months after the irruption, the shield was once more entered.

Now, however, a fresh obstacle presented itself to the further progress of the work; the experience hitherto gained had shown that the means devised by Sir Isambart were fully adequate to the accomplishment of the desired end, but the funds of the company were found to be nearly exhausted, and consequently the suspension of the works became inevitable.

In order to make the tunnel as secure as possible, and prevent any recurrence of an irruption, Sir Isambart recommended that the shield should be blocked up with brickwork, and a solid wall built at the end of both arches, so as entirely to shut out the river, which was done in the following July.

In this state the tunnel remained until the beginning of 1835, when an act of Parliament having been obtained, authorising the Exchequer Loan Commissioners to advance money for its completion, the works were resumed; Mr. Page being appointed Resident Engineer.

The old shield had been so much injured by the two irruptions, that it was determined to replace it by another; in which many improvements were introduced, and which was made of much greater strength than the first. The operation of removing the old shield, and erecting the new one, was peculiarly difficult, from the necessity of securely supporting the ground during the whole of the time, and from the confined space in which the work had to be performed; it was, however, successfully accomplished by the 13th of February, 1836, on which day the first movement of the new shield was made.

The progress of the shield, although slow, was tolerably steady, until the middle of June, when the ground became so bad that it was frequently found necessary to block up many of the frames with planks, straw, and other materials. Towards the end of July the ground somewhat improved, and a greater rate of progress was attained. In the following March, however, the progress became again checked, and during several weeks nothing whatever was done; during these periods of delay very considerable expense was incurred, from the necessity of keeping up nearly the same establishment of men as when the works were in full progress. At this time the bed of the river over the shield was constantly watched, soundings being taken every tide, and bags of clay and gravel being immediately thrown in, whenever any depression was discovered.

During July and August a little progress was made, but on Aug. 23rd the river broke into the tunnel for the third time, after a conflict of several hours. Fortunately no lives were lost on this occasion, and such energetic measures were taken for repairing the evil, that in a week's time the hole in the bed of the river had been filled, the tunnel partially cleared of water, and the shield re-entered; and in less than a month, the progress of the shield was resumed, and the work was carried on with the utmost caution; notwithstanding which, however, on the 3rd of November, the Thames once more invaded the tunnel, and on this occasion one of the men was unfortunately lost.

Within a fortnight of the irruption, the shield was once more in the possession of the miners, and in a little more than six weeks the whole was restored to order, and progress was resumed, although very slowly.

During February and the early part of March, 1838, a quicker rate of progress was attained, and hopes were entertained of still further improvement, when on the 20th, the river broke in for the fifth and last time. The progress of the shield was, however, resumed within a fortnight, and continued without further interruption.

Want of space permits our giving in greater detail, the many difficulties which were encountered, and describing the admirable contrivances by which they were successfully overcome, as well as narrating the many instances of courage and zeal afforded by the men, of whose conduct Mr. Page (the Acting Engineer, under whose direction the tunnel was constructed subsequent to August, 1836) has remarked, "Although custom renders every danger or appearance of danger familiar, yet no one can witness the conduct of our fine fellows in the shield without emotion. In many a trying scene they have stood to their posts in a manner so collected and unflinching that I cannot speak too highly in their praise; and in after times when the circumstances attending the progress of the Thames Tunnel are brought before the public, the behaviour of the miners, particularly the top men, will not be forgotten." For a fuller account we must refer the reader to the article on the Tunnel already alluded to in "Weale's Quarterly Papers on Engineering."

In August, 1840, the tunnel having been completed to a length of 1145 ft., and the shield having arrived within about 60 ft. of the site intended for the shaft on the Wapping side of the river, its further progress was stopped, until the latter had been completed, as it was apprehended that some settlement in the tunnel might be produced, during the operation of sinking the shaft, if brought too close to each other. The construction of the shaft was immediately proceeded with; it was made 55 ft. in external diameter at the bottom, but only 53 ft. in diameter at the top, the object in making it taper, being to avoid its becoming earth-bound, as that on the Rotherhithe side had been; and this expedient was found to answer perfectly, no difficulty being experienced in sinking it to the full depth required. In sinking this shaft three distinct lines of piles and camp-shedding were met with, showing the existence of ancient wharfs on the banks of the Thames, much below its present level.

In June, 1841, the shaft having then been sunk to a depth of 27 ft., a small driftway was carried from the tunnel under the shaft, and a pipe driven up, by means of which the excavation for the latter was effectually drained. On the 12th of August the excavators in the shaft reached the top of the driftway, and on the same day Sir Isambart Brunel achieved that which had for years been the object of his most ardent hopes, and untiring perseverance, by passing through the tunnel from Wapping to Rotherhithe.

The work was now again resumed in the shield, and by the latter part of November the middle frames had touched the brickwork of the shaft, through which it passed in the same manner as it had passed through the ground, and did not stay its march until the whole of the frames were entirely within the shaft. The brickwork of the tunnel was made good to that of the shaft, after which in the early part of 1842, the shield was taken to pieces and removed, the shafts cleared, the permanent staircases erected, and the superstructure on the top of the shafts built. These operations necessarily occupied much time, and before the pumping machinery in the Rotherhithe shaft could be removed, other pumps for the permanent drainage of the tunnel, had to be erected in the first cross-archway on that side of the river. It was not, therefore, until the 25th of March, 1843, that the tunnel was opened as a public thoroughfare for the passage of persons from one shore to the other beneath the bed of the Thames.

The total cost of the tunnel up to the present time has been 454,714*l.*; of which 180,000*l.* was subscribed by the original shareholders, or was raised upon debentures, and the remainder was advanced by the Exchequer Loan Commissioners. To complete the carriage descents or approaches it is estimated that a further sum of 180,000*l.* would be required, which would make the total cost of the tunnel available for carriage traffic only 634,714*l.*, a sum very little more than half that which either London or Waterloo bridges cost.

UNION WORKHOUSES

Are specially applicable for the lodging and protection of the poor in and about London. A great many parishes in the metropolis are regulated under the provisions of the Poor Law Act of Parliament. We will select as an example one of recent erection.

The *City of London Union Workhouse* is situated most advantageously in the Bow Road, Mile End. It is an edifice of much beauty and architectural effect. Mr. Richard Tress was the architect.

The area occupied by this establishment is about 4½ acres, situate in the Bow Road, partly in the parish of Mile End Old Town, and partly in St. Leonard's, Bromley, abutting on the high road, and contiguous to the Tower Hamlets Cemetery; a fine open and healthy situation, with a clean gravelly subsoil. The first stone was laid by Mr. Alderman Gibbs on the 20th of June, 1848, and the building was finished and thrown open to public view on the 12th of November, 1849. The style of architecture is Italian, with a campanile in the centre, 100 ft. from the ground, on either side of which is a lesser tower, each 70 ft. in height. Beneath are the principal stairs, forming a central communication to all parts of the house, on one side of which are the day and bed-rooms of the master and male officers, and on the other side those of the matron, &c. The chapel is in the front of the building, a neat and unostentatious edifice, with an open timber roof stained and varnished. It has an altar-piece of white marble cement, with two columns of solid marble, each column in one entire stone. These columns, are supposed to have been presented by the Emperor of Russia to his English ambassador and were found among the old materials removed from the site, and reserved by the architect for the purpose to which they are applied. The tablets upon the altar-piece of enamelled slate, containing the commandments, were gratuitously written in gold by the vice-chairman of the guardians (Mr. Thornton), and the stained-glass window above was a present from Mr. Vigers, guardian of the precinct of Whitefriars. One side of the building is appropriated for males, and the other for females, but both sexes use the dining-hall and chapel.

The dining-hall is upwards of 100 ft. in length, 50 ft. wide, and 28 ft. high, with an open timber roof, and is capable of accommodating more than 800 persons.

The kitchens adjoining the dining-hall are furnished with a steam-cooking apparatus, and the building is heated throughout with warm water. There are hot and cold water lavatories and baths in every department of each floor from the receiving ward to the infirmary.

The whole of the corridors are fireproof, and are laid with metallic lava. There are numerous fire mains connected with the pump by which the institution is supplied with water from a well 247 ft. deep, sunk 70 ft. into the chalk.

The infirmary is calculated to contain 200 patients, and is, as well as the fever hospital, detached from the main building. In addition to cells for refractory paupers, there is accommodation for the imbecile, &c.

The establishment has accommodation for 1100 paupers besides officers.

The sanitary improvements consist of water-closets on the ground and one-pair floors, with double doors to prevent the escape of effluvia into the house: a wire is attached to the inner door, so that no one can enter or leave without letting the water flow to clear the pans. Below the pans or seats is a trough, constantly full of water, into which the soil falls, and is thence floated into the main sewer by flushing taps.

The total cost of the building was about 58,000*l*. The city is divided into 97 parishes and one precinct, and has 101 guardians.

WATER SUPPLY OF LONDON.

The supply of water to large towns has now become a subject of such great importance, and involves problems of so extensive and complicated a nature, that its treatment has called forth in an especial manner the resources of science, and occupied the attention of some of the most eminent philosophers and practical engineers of modern times.

London affords a good example of the magnitude of the operations required for furnishing this indispensable element of health and comfort to a large city. The daily quantity of water supplied to the inhabitants of the metropolis is nearly twice as much as would fill St. Paul's Cathedral; this is drawn from sources in some cases many miles distant; it has to be purified and fitted for domestic use; elevated often to a height of hundreds of feet above its original level, and finally distributed through every street and into the interior of almost every house, over an area of little short of 100 square miles. It may easily, therefore, be conceived that the operations for accomplishing these objects must be on a scale of considerable magnitude, and must require, in their arrangement and management, no small degree of scientific and technical skill.

The following few pages will contain a concise account of the manner in which the metropolis is at present supplied with water, prefaced by a short historical notice of the several steps by which the system has arrived at its present state of advancement.

HISTORICAL NOTICE.

In early times, the inhabitants of the metropolis obtained their principal supplies of water by direct carriage from the river Thames, or from the tributary brooks and streams in the immediate vicinity. As, however, the city increased in size, access to the river became more inconvenient, and the labour of carriage more difficult for those who lived at a distance; and recourse was then had to springs discovered on the higher grounds, the waters of which were conveyed through earthen or leaden pipes, often of considerable extent, to *conduits* or fountains conveniently situated for distribution. The memory of these ancient sources of supply still survives in many familiar local names. Thus *Walbrook* and *Holborn* (formerly Oldborne, the word *borne* or *boorne* being synonymous with the northern word *burn*, a brook) remind us of streams formerly limpid and salubrious, but now converted into dirty subterranean drains;—*Holywell* and *Clerkenwell* perpetuate the remembrance of fountains, once celebrated and probably perennial, but now concealed by masses of densely-inhabited buildings;—while *Conduit Street, Lamb's Conduit,* and *White Conduit,* indicate no less clearly the localities of artificial hydraulic constructions, once works of magnitude and importance, but which have long since disappeared.

This state of things continued till about the middle of the sixteenth century, when the metropolis had so increased in extent that the conduits and small streams became insufficient to meet the increasing demands for water, and it was again found necessary to have recourse to the more copious supply derivable from the river Thames. In the first instance it was attempted to bring the water from the river to the interior of the city by conduits at a low level, but the necessity of raising it threw great obstacles in the way of this method of supply, and led to the substitution of another scheme, which was eminently successful, and may be called the first metropolitan water-works worthy of the name.

In 1581, Peter Morrys, an enterprising Dutchman, conceived the bold idea of forcing the water from the Thames by mechanical pumping power, through pipes in the streets, into the houses of the inhabitants. His proposals were favourably received by the corporation, who granted him the necessary powers, and he proceeded forthwith to establish his works. These consisted of a water-wheel erected under the first arch of London Bridge, which, being turned by the tidal stream, worked forcing pumps, and thus impelled the water through leaden or wooden pipes in the streets, and thence by branches into the houses. The power exerted by the machinery was so great that Morrys was able to give public proof of his skill, by throwing a jet of water over the steeple of St. Magnus Church, to the no small admiration of the wondering citizens, seeing that before that time "no such thing was known in England as this raising of water." His works succeeded so well that two years afterwards another water wheel was erected in the second arch, and the distribution within the city was proportionably extended. The *London Bridge Waterworks,* thus established, subsequently increased further in magnitude, and kept up for nearly 200 years a strong competition with the New River. They eventually, however, became unprofitable, and, after passing into the possession of the New River Company, were demolished along with Old London Bridge in 1831.

The success of Morrys's works gave an impulse to hydraulic operations, and several schemes were soon set on foot for the supply of those parts of the metropolis which lay beyond the reach of his mains; but none of these require further notice here except one gigantic undertaking—the New River, which, considering the comparatively unadvanced state of engineering science at that time, remains a monument of skill and enterprise, of which the city of London has just reason to be proud.

In 1606 an act of Parliament was obtained to enable the corporation to bring a stream of pure water to the metropolis, by a canal, from the springs of Chadwell and Amwell, upwards of twenty miles distant, in Hertfordshire; but the corporation, alarmed probably at the magnitude of the plan they had projected, hesitated to commence the works, until, in 1609, an enterprising citizen, Mr. Hugh Myddelton (afterwards Sir Hugh Myddelton, baronet), offered to execute them single-handed, on condition that the authority previously obtained from Parliament should be transferred to him. His offer was accepted, and he at once commenced the work; but through a complication of difficulties, and the ungracious refusal of the corporation to aid him in his arduous undertaking (although he had brought his canal to within a few miles of London), he was compelled to appeal to King James I. for the means of completing the works. The King furnished the necessary grant of money on condition that half the property in the New River should be ceded to him, and on the 16th of September, 1613, the canal being completed, the water flowed into the reservoir at Clerkenwell, amidst the rejoicings of a large concourse of people assembled to witness the ceremony. The accomplishment of this important project has immortalized the name of Hugh Myddelton, whose disinterested perseverance, fortitude, and industry in completing so useful an undertaking, have eminently entitled him to the grateful remembrance of the citizens of London. The advantages the metropolis derives from his labours will probably endure yet for centuries to come.

The New River, the London Bridge works, and what remained of the more ancient conduits, kept the greater part of the metropolis well supplied with water for the whole of the seventeenth century; but as buildings began to extend westward, new demands arose; and again the Thames was reverted to as the most obvious source for an increased supply. In 1691 a company was formed called the *York Buildings Waterworks Company,* for supplying a part of Westminster with water pumped from a point in the river near Charing Cross. These works flourished for some time, but failed under competition with the more copious supplies of larger companies, notwithstanding many important improvements introduced by that eminent engineer, the late Mr. Rennie. In 1818 the works were leased to the New River Company, and in 1829 were abolished altogether.

In 1723 a more successful attempt was made in the establishment of the *Chelsea Waterworks,* for supplying the city of Westminster, and parts adjacent, with water taken from the Thames at Chelsea Reach. For this purpose a company was formed, which was constituted a corporation by a charter granted by George I. in 1724. In 1729 they purchased the Millbank Waterworks, which had existed many years previously, but had then fallen into difficulties; in 1743 they erected their first steam-engine, and in 1810 removed to the site they at present occupy. The company had the privilege of making reservoirs in the royal parks, as well as of supplying water for the palaces and government buildings, and their operations otherwise extended over a large and populous district; but at first the returns were barely adequate to meet the current expenses, and when profits began to accrue they were for a long period capitalized in extending the works; yet, by perseverance, good management, and continual improvements in the engineering department, the concern at length became profitable, and is now one of the most flourishing of the metropolitan water companies.

After the establishment of the Chelsea Company, no material change took place for eighty or ninety years, beyond the gradual extension and improvement of the works then existing, and the introduction of iron street-pipes * in lieu of wooden ones, the expense, leakage, and other inconveniences of which had been severely felt. The use of the new material not only enabled the old works materially to improve their supplies, but gave a great advantage to new companies entering the field in competition with them.

In 1806 an act of Parliament was obtained for taking water from the Thames, for the supply of Hammersmith, Kensington, and the vicinity, in which direction buildings were fast increasing. The company who carried out this undertaking took the title of the *West Middlesex Waterworks Company.* They did not at first succeed in the suburban districts, in consequence of the plentiful supplies of water found in springs and wells; but in 1810 they obtained further powers to extend their works into the north-west districts of London, where they now furnish a large portion of the supply.

In 1811 another company was formed, who availed themselves of the powers granted by a clause in the Grand Junction Canal Company's Act, for supplying (also to the north-west part of London) water brought by the canal from the rivers Colne and Brent, and from a large reservoir supplied by land drainage in the north-western part of Middlesex. These waters were represented to be much superior to that of the Thames, but experience disappointed the hopes of the projectors; the water was found not only to be bad in quality, but deficient in quantity also, and after vain expedients to remedy the evils, the company, which had taken the name of the *Grand Junction Waterworks Company*, resorted, in 1820, to the Thames, taking their entire supply from a point near Chelsea Hospital.

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* In 1746, the Chelsea Company laid their first iron main for conveying water from their works on the river to their reservoir in Hyde Park. From this time to 1810 the introduction of iron pipes was principally limited to the larger mains, but after that date the use of the new material became very general. The system of high service supply was demanded by the inhabitants of the better class of houses; and the old pipes of wood, stone, or pottery being unable to withstand the increased pressure, they were soon replaced by those of iron throughout the whole of the districts supplied.

While these improvements were going on in the west, the inhabitants of the other end of the metropolis had not been idle; the districts eastward, beyond the reach of the mains of the New River or London Bridge works, had hitherto been dependent on two small establishments at Shadwell and West Ham; but as the population increased, and further supplies became necessary, a company was established under the name of the *East London Waterworks Company*, for supplying water from the river Lea. Their act was obtained in 1806; they immediately erected works at Old Ford, near Bow, and soon spread their mains over an extensive district.

The portion of the metropolis lying south of the river Thames was first supplied with water by two wheels erected under London Bridge, near the Surrey shore, and also by separate works at St. Mary Overies. These two establishments, both of considerable antiquity, were combined, under the name of the *Southwark Waterworks*, in 1822.

In 1785 the *Lambeth Waterworks Company* was established for supplying the parish of Lambeth and parts adjacent with water taken from the Thames, at a site nearly opposite Hungerford Market. They commenced their operations with a small capital, but by careful management, and avoiding a large expenditure at the commencement, their enterprise was attended with success.

In 1805 a third company, the *Vauxhall Waterworks Company*, was established for supplying the Surrey side of London. They took their water at first from the river Effra, and subsequently from the Thames, near Vauxhall Bridge.

All the companies, whose rise we have chronicled above, in the first instance, supplied water just as it came to hand, without being over particular as to the state it was in. Between the years 1820 and 1830, however, the attention of the public was attracted to the quality of the water they were receiving, and since it appeared that improvement was needed, the companies, urged by the pressure from without, took steps to improve it accordingly.

The Chelsea Company led the way, and their engineer, Mr. Simpson, has the credit of first carrying into effect, on the largest scale, the important process of *filtration*, by which the good quality of the water supplied was effectually insured. In 1825, 1826, and 1827, he made many experiments, with a view to the introduction of this process, and in 1829 the first large filter, of one acre area, was set to work, and so perfect was its operation, that the subsequent experience of twenty years has suggested no material improvement on the principle of its construction.

The New River Company made extensive settling reservoirs, and discontinued a supplementary supply which they had occasionally drawn from the Thames;—the Grand Junction Company (the character of whose water had been most impugned) removed their source of supply from Chelsea to near Brentford, and formed filtering reservoirs there;—the West Middlesex Company constructed large reservoirs;—the East London removed their source higher up the Lea;—and, though somewhat later, the Southwark and Vauxhall Companies amalgamated, abolished their old sites, and established new works at Battersea.

The Lambeth Waterworks Company, shortly after 1830, formed elevated reservoirs at Brixton Hill and Streatham, for the purpose of improving the service generally, and maintaining a constant supply of water in case of fire. They have lately, however, made a bolder improvement; for, considering the state of the river in the tide-way objectionable as a source of supply (owing principally to the constant agitation kept up by the steamers plying between the bridges, and the increased quantity of sewage poured into the Thames in the London district) they obtained, in 1848, an act to enable them to abandon their former source opposite Hungerford Market, and to take water from the pure stream of the river at Ditton, twenty-three miles above London Bridge, and beyond the reach of the tide. The works are now in progress, and it is stated the water will be brought into London in the autumn of the present year.

DESCRIPTION.

The metropolis is now supplied with water by seven companies *, five on the north side of the Thames, namely,—

1. The New River Company.
2. The East London Waterworks Company.
3. The Chelsea Waterworks Company.
4. The West Middlesex Waterworks Company.
5. The Grand Junction Waterworks Company.

And two on the south side, namely,—

6. The Lambeth Waterworks Company.
7. The Southwark and Vauxhall Waterworks Company.

In addition to the above may be mentioned the two following, which supply suburban districts:—

8. The Hampstead Waterworks Company; and,
9. The Kent Waterworks Company.

Each company supplies a certain district, marked by distinct boundaries. Formerly many of the companies were frequently engaged in competition with each other over the same ground; but the effects of this were so ruinous, that it ultimately led to a mutual arrangement, by which separate limits were assigned to the operations of each company †.

The following brief descriptions will give an idea of the works of the different companies, and the districts they respectively supply.

The New River Company derive their supply from sources in Hertfordshire, of which the principal are, 1st, a copious spring, called the Chadwell Spring, situate between Hertford and Ware; 2nd, an arm of the river Lea, in the same neighbourhood; and 3rd, wells sunk into the chalk at Amwell. These united waters are conducted by an artificial channel, called the "New River," to London. The distance of the sources from London, in a direct line, is about twenty-one miles; but as the New River winds considerably, in order to take advantage of suitable levels of the ground, its total length is nearly forty miles. Its average dimensions are about 18 ft. wide and 5 ft. deep, and it has an average fall of 3 inches in each mile of length. Leaving Ware, it turns southward, and passes through or near Broxbourne, Cheshunt, Enfield, Winchmore Hill, Hornsey, Stoke Newington, Balls Pond, and Islington, to reservoirs

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* Supplies of water are also obtained from wells, which are of two kinds; namely, 1st, shallow wells, receiving surface drainage; and 2nd, deep borings sunk through the tertiary strata on which London stands, into the chalk below. The former, though happily almost obsolete, are still resorted to for drinking by some few inhabitants, not yet made aware of the fearful risk they run from the thousand abominations that contaminate the subsoil of a large town; the latter are used principally by breweries and other establishments of sufficient extent to go to the expense of sinking for their own water supply. A well, near Charing Cross, 383 ft. deep, sunk by Messrs. Easton and Amos, for the government, supplies the Trafalgar Square fountains, Buckingham Palace, and several of the government offices in Whitehall.

† In some portions of the south side of London, two companies still supply the same district, but the rancorous feeling of rivalry that formerly prevailed exists no longer.

at Clerkenwell, where the water is delivered for distribution in London. At Stoke Newington there are two large reservoirs, occupying thirty-eight acres of land, and containing several weeks' supply, in which the water is allowed to remain at rest and become clear before it enters the New River Head. There are upwards of 160 bridges over the New River, and nearly sixty culverts under it for the passage of streams, &c.

The reservoirs at the New River Head, Clerkenwell, occupy about five acres, and lie at an elevation of 85 ft. above high water of the river Thames; from these the water flows by its own gravity into the mains supplying the lower parts of the district; while two steam-engines, of about 150-horse power each, are employed for pumping into another reservoir in Claremont Square, about 30 ft. higher, and for supplying the high services generally. The northern parts of the district, including the hills of Hampstead, Highgate, &c., are supplied from the Stoke Newington reservoirs, by two steam-engines erected there, aided by another at Highgate, where there are also two elevated reservoirs, one lying at about 320, and the other at 420 ft. above the Thames. The company derive an auxiliary supply from a well, 230 ft. deep, sunk into the chalk, in the Hampstead Road; the water being pumped into a reservoir by a steam-engine of 50-horse power.

The district supplied by the New River Company is very large, comprehending the whole of central London; the western boundary is a line drawn from Charing Cross by the Haymarket, Tottenham Court Road, and Hampstead Road, northwards to Highgate; the eastern boundary is a line running directly north from the Tower to Stamford Hill. The number of houses supplied in 1849 was 83,206, and the average quantity of water 14,149,315 gallons per day.

The engineer to the New River Company is Mr. William Chadwell Mylne.

Notwithstanding the large quantity of water already supplied by this company, they are taking steps to increase it considerably. They are now laying down a large main for bringing an extra supply from the river Lea, at Tottenham; and are applying to Parliament, this session, for powers to shorten the New River, by cuts, to about two-thirds of its present length, and otherwise to improve its channel. These alterations will enable them to convey into London a large additional quantity of water from collecting reservoirs about to be formed in Hertfordshire, on the streams feeding the river Lea.

The East London Waterworks Company's establishment is situated at Old Ford, near Bow. The water is taken from the river Lea, at Lea Bridge, about two and a half miles above the works, and upwards of six miles from the junction of the Lea with the Thames; it is brought to Old Ford by an open cut or canal, and after being allowed to settle in large subsiding reservoirs, is pumped by steam power into the mains of the district. For this purpose the company has several steam engines, amounting together to above 500-horse power, among which are one Cornish engine with an 80 in. cylinder, and 10 ft. stroke*; and another of the same kind with a 90 in. cylinder and 11 ft. stroke working a plunger pump 44 in. diameter and 11 ft. stroke. The pressure requisite to drive the water through the mains in the district is given by a column of water in a vertical iron pipe, open at the top, called a *stand-pipe,* about 130 ft. high, and 5 ft. in diameter at the bottom, and 3 ft. 6 in. at the top, the water being kept at a suitable level in the pipe, by the action of the pumps of the steam-engines. In addition to the Old Ford works, the company have also a reservoir and water wheels at Lea Bridge, for distributing supplies in that neighbourhood, and an elevated reservoir on Stamford Hill.

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* This engine, erected in 1838, was the first Cornish engine used for other than mining purposes. Mr. Wicksteed, under whose direction it was introduced, has given a full account of it in "An Experimental Inquiry on Cornish and Boulton and Watt Pumping Engines." See also "Pole on Cornish Engines," both published by Mr. Weale.

The district supplied is the whole of the eastern part of London, extending from the boundary of the New River district to the river Lea, and including Limehouse, Stepney, Poplar, Bromley, Bethnal Green, Hackney, Homerton, Clapton, &c. The number of houses supplied in 1849 was 56,409, and the average daily quantity of water 8,829,462 gallons.

The engineer of the East London Waterworks is Mr. Thomas Wicksteed.

The Chelsea Waterworks are situate on the north bank of Chelsea Reach, about a quarter of a mile to the east of Chelsea Hospital. The company have on this spot about 20 acres of land, on which their works are constructed. The water is drawn from the Thames by engine power through a cast-iron conduit laid in the bed of the river, and is pumped into subsiding reservoirs, of which there are three, lined throughout with brickwork. They are used alternately, *i. e.*, while one is emptying into the filters, a second is subsiding, and the third is being filled from the river. They are elevated somewhat above the ground line, and the water, after remaining some time in them, is allowed to flow by its own gravity into large *filter beds,* where it is further purified by filtration through sand and gravel. The filter beds, two in number, are about one acre each superficial area, of which the lowest part is occupied by the filtering materials, consisting of layers of sand and gravel, the finest sand being at the top, coarser sand, shells, and fine gravel below, and coarse gravel and pebbles at the bottom. The water percolates through these strata, and finds its way into open-jointed brick culverts imbedded in the lowest stratum of gravel, and through them into filtered water wells, from whence it is drawn by the engines, and distributed into the mains for the supply of the town. The two filtering beds are used alternately, being changed at intervals; for, after a certain lapse of time (dependent on the state of the water in the river), the upper surface of fine sand requires to be scraped off, and the alternation of the filter beds gives the opportunity of doing this without interruption to the supply. The water, after passing through the filters, is perfectly clear and bright, and fit for every domestic use.

There are seven steam-engines on the works, namely, two for pumping the water from the river to the subsiding reservoirs; two* for supplying the district generally; one for furnishing a supply to the round pond at Kensington and to the Serpentine River, and for watering the drives in and around Hyde Park, Grosvenor Place, &c.; and two for supplying Kensington Palace, the building for the Exhibition of 1851, and certain other special services.

The Chelsea Company have, in addition to the reservoirs at the works, two elevated reservoirs at a distance, for the purpose of keeping the mains constantly charged, and a large supply of water always in readiness, in case of fire. One of them, in the Green Park, is at an elevation of 44 ft. above Trinity high-water mark of the Thames, and contains about 3,250,000 gallons. The other is in Hyde Park, at an elevation of 70 ft., and contains about 1,500,000 gallons.

The district supplied by the Chelsea Waterworks Company extends east and west from Charing Cross to Fulham, and north and south from the Thames to the Uxbridge Road; it comprehends Chelsea, Knightsbridge, the whole of Belgravia and Pimlico, and a large portion of Westminster. The number of houses supplied in 1849 was 20,893, and the average quantity of water 3,940,730 gallons per day.

The engineer to the Chelsea Waterworks Company is Mr. James Simpson.

The West Middlesex Waterworks Company's works are at Hammersmith, on the left bank of the river, about half a mile above the suspension bridge, and 9½ miles above London Bridge. The water from the Thames is admitted to two large subsiding reservoirs, together above 16 acres area, on the right bank or Surrey side of the river, and is conveyed from them by a conduit pipe laid under the bed of the stream to the works on the opposite shore. Here the company have three pumping engines, viz. two of 70-horse power each, and one of 105-horse power, for the purpose of supplying the district. A new principal main, 30 inches in diameter, has been lately laid down, extending for a considerable distance from the works towards London. There are two elevated reservoirs, one at Kensington, 111 ft. above Trinity high-water mark, and containing about 3,500,000 gallons; and one on Primrose Hill, 177½ ft., containing 4,750,000 gallons.

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* Complete drawings of one of these engines are given in "Tredgold on the Steam Engine."

The district supplied by the West Middlesex Waterworks Company extends west of Tottenham Court Road and north of Oxford Street, as far as the Edgeware Road, including Portland Town, Kilburn, West End, and other adjoining parts. They also supply a large western suburban district, including Kensington, parts of Fulham and Brompton, Hammersmith, Chiswick, &c. The number of houses supplied in 1849 was 24,480, and the average quantity of water 3,334,054 gallons per day.

The engineer is Mr. William Tierney Clark.

The GRAND JUNCTION WATERWORKS COMPANY'S works are situated on the left or north bank of the Thames, a little above Kew Bridge, and about fourteen miles above London Bridge. The water is taken by a large conduit pipe from the middle of the river to the works on the shore, where it is pumped into subsiding and filtering reservoirs, and then supplied to the town. There are six engines, two for pumping from the river to the filter beds, and four to supply the district. The principal of the latter is a Cornish engine, with a cylinder 90 in. in diameter and 11 ft. stroke, working a plunger-pump of 33½ in. in diameter and 11 ft. stroke *. Attached to this engine is a stand-pipe, which forms a conspicuous object in the neighbourhood of the works, and is of somewhat peculiar construction. It is nearly 220 ft. high, and consists of a central pipe 5 ft. in diameter at the bottom, tapering to 3 ft. at the top, surrounded by four other pipes of 12 in. diameter each. The central pipe is connected at the bottom to the pump of the engine, and at the top to the four surrounding pipes, the lower end of these latter being connected to the main which brings the water to London. The water forced by the pump ascends the central pipe, and falls over into the surrounding ones, down which it passes into the main. It is a consequence of this arrangement that the water will stand at such a height in the descending pipes as will give the pressure required to drive the water along the main and into the district to be supplied. The main which brings the water to London is between six and seven miles in length, and 30 in. internal diameter. The company have an elevated reservoir for storing water on Camden Hill, Bayswater, containing 6,000,000 gallons.

The district supplied by the Grand Junction Company comprehends that part of the parish of St. George, Hanover Square, which lies north of Piccadilly, a small portion of Marylebone, the larger part of Paddington, and St. James's to Pall Mall. The number of houses supplied in 1849 was 13,858, and the average quantity of water 3,532,013 gallons per day.

The engineer is Mr. Joseph Quick.

The LAMBETH WATERWORKS have hitherto taken water from the Thames, near Hungerford Bridge; but as this source of supply will be abandoned, and the new works come into operation, during the present year, 1851, we will restrict our description to the latter.

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* This engine is one of the largest of the kind ever made. It was erected by Messrs. Sandys, Carne, and Vivian, of Hayle, Cornwall, in 1845. It raises 3257 gallons of water per minute to a height of upwards of 200 ft.

The works are situated on the right or south bank of the river Thames, at Long Ditton, a mile and a half above Kingston, and nearly opposite Hampton Court Palace. This site is twenty-three miles above London Bridge, and three miles above the highest range of the tide. The water is here usually very clear and pure; but as it is occasionally disturbed during floods, it is considered desirable to filter it at all times: it is, therefore, admitted from the river into a series of sunk filtering reservoirs, in which it descends through layers of sand, shells, and gravel, and is then passed away by culverts to the steam-engines. These force it through a large cast-iron main or aqueduct pipe, ten miles long, to elevated reservoirs at Brixton, from which it is distributed through the entire district supplied. The steam-engines are collectively of 600-horse power, and are calculated to pump 10,000,000 gallons of water per day*. The aqueduct, or main pipe, is 30 in. in diameter; it passes from the works through Kingston New Town in an easterly direction, proceeding for two miles by the side of the South Western Railway, thence along the turnpike road through Merton, Tooting, and Balham, and finally across Clapham Park to the company's reservoirs. These are situated at Brixton Rise, on the Croydon Road, at a height of about 100 ft. above the Thames, and contain upwards of 12,000,000 gallons. From these reservoirs the water flows by its own gravity through the mains for the supply of all that part of the district lying at a lower level; but as the company also supply portions of the southern suburbs lying higher than this, it becomes necessary again to employ steam power. An engine is erected at Brixton, which lifts water into another reservoir, near St. Ann's Schools, Streatham Hill, at a level of about 100 ft. above Brixton, while at Streatham another engine supplies those parts lying higher still. The highest service given by the Lambeth Company is at Norwood, about 350 ft. above the Thames.

The district which the Lambeth Waterworks Company have power to supply is very large. It extends from the Thames on the north, to Croydon on the south, and from Lewisham and Beckenham on the east, to Thames Ditton and Esher on the west. The number of houses supplied in 1849 was 23,396, and the average daily quantity of water 3,077,260 gallons; but it is expected that when the new works come into operation this supply will be more than doubled.

The engineer is Mr. James Simpson.

The works of the SOUTHWARK AND VAUXHALL WATERWORKS COMPANY are situate on the right bank of the Thames, in Battersea Fields, where there are two depositing reservoirs, containing 32,000,000 gallons; and two filtering reservoirs, containing 11,000,000 gallons. The water is received from a lifting engine into the first reservoir, and passes from thence to the extreme end of the second reservoir, by which means the whole of the water has to travel over the entire surface of both reservoirs before it is taken on to the filtering beds. After the water has passed through the reservoirs of subsidence, it enters the filtering reservoirs where it has to percolate through a filtering medium, composed of the following strata, viz.:—

	ft.	in.	
1. A layer of clean sharp river sand	2	0	thick
2. A layer of hoggin, or fine gravel	1	0	„
3. A layer of fine screened gravel	0	9	„
4. A layer of rough screened gravel	0	9	„
5. A layer of coarse gravel	1	0	„
	5	6	„

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* These engines are on the double-cylinder expanding principle, from designs by Mr. Simpson, the engineer to the company; they have adapted to them the patented improvements of Messrs. Pole and Thomson, and are expected to possess advantages over any of the kind hitherto erected.

The water is then received into brick tunnels, formed with open joints in cement, which communicate with a main tunnel leading to the pump wells of the engines. There are four steam-engines, one on Sims's combined cylinder principle, of 30-horse power, for lifting the water from the river; two on the Cornish principle, of 130 and 145-horse power respectively, for supplying the district; and one of 50-horse power, kept in reserve. The water is forced by the engines up two large vertical stand-pipes, about 150 ft. high, each of which has ascending and descending legs, the column in the latter serving to drive the water through the mains in the town.

The district supplied is the Borough of Southwark, and the parishes eastward of the Borough as far as Rotherhithe, and south as far as Camberwell; also portions of Lambeth and Clapham, and the whole of Battersea. The number of houses supplied in 1849 was 34,217, and the average daily quantity of water 6,013,716 gallons.

The engineer is Mr. Joseph Quick.

The Kent Waterworks Company take water from the river Ravensbourne, below Lewisham; their pumping establishment is situated on the banks of this river at Deptford, where they have reservoirs and filtering basins, and three pumping steam-engines; they have also reservoirs for filtered water in Greenwich Park, on Woolwich Common, and near the Marine Barracks at Woolwich. The whole of the works have recently been remodelled and enlarged.

This company supply Deptford, Greenwich, and Woolwich, and also parts of Rotherhithe, Camberwell, and other places in the south-eastern suburb. In 1849 they supplied 9632 houses, and delivered 1,079,311 gallons per day.

The engineer is Mr. William Richard Morris.

The Hampstead Waterworks Company are of considerable antiquity, having been established under 35th King Henry VIII., cap. 10; they obtain water from springs at Hampstead and Caen Wood, and from two deep wells; they have reservoirs of 35 acres area, formed by embankments across the valleys between Highgate and Hampstead, at different elevations; and two steam-engines are used for pumping. Their district lies in Kentish Town and Camden Town. In 1849 they supplied 4490 houses, and distributed an average quantity of 427,468 gallons of water per day.

The general system of supply is the same in each district. Through all the principal streets are laid large pipes of cast-iron, called *mains*, varying from 36 inches down to 2 or 3 inches in diameter, the largest being situated nearest to the source of supply, and the size gradually diminishing to the extreme parts of the district. These mains are always kept filled with water under considerable pressure, either by the action of gravity from an elevated reservoir, or by the forcing action of pumps worked by steam-engines. Subsidiary ramifications of cast-iron pipes, of smaller size, called *service-pipes*, are also laid in the streets, extending throughout the whole district supplied; these are connected at certain points to the mains, from which they thereby receive the water; but the points of junction are furnished with cocks, by which the communication can be stopped, and the water shut off from the service-pipes at pleasure. For supplying a house with water, a lead pipe is laid down underneath the pavement, one end being fixed into a hole made in the *service-pipe* in the street, and the other passing into the inside of the house and opening into a cistern provided for the purpose. When, therefore, the communication-cock above mentioned is open, the water flows from the charged main into the service-pipe, and thence by the lead pipes into the house cisterns. The flow of water into the latter is stopped by a self-acting cock and float (called a ball-cock) as soon as each cistern is full.

The object of the arrangement of mains and service-pipes above described is to enable the companies to use what is called the *intermittent,* in contradistinction to the *constant,* system of supply. It would be a very simple thing to attach the lead house-pipe at once to a *main* without the intervention of the *service-pipe,* in which case the water would be what is called *constantly on, i. e.,* constantly ready to flow whenever the cock within the house was opened; and this system, which has its advantages, is adopted in many country towns; but from the difficulty of finding convenient sites for elevated reservoirs, and for other technical reasons, which it would be out of place here to enter into, this system has hitherto not been attempted in London, and the plan is adopted, in preference, of dividing a district into several portions, and supplying each portion, in turn, for a short time only. With this view the service-pipes already mentioned are laid down, and a set of men are employed, called *turncocks,* whose business it is to open, at proper intervals, the communicating cocks between them and the mains, and thereby to *turn on* the water. The frequency of the intermittent supply, and the length of time the water is "on," vary under different circumstances; but the most common practice in London now is to give a supply for one or two hours every day, with the exception of Sunday. It is a natural consequence of this arrangement that every house must be provided with a cistern large enough to store the whole quantity required by the inhabitants during the intermission of the water supply, be it for what length of time it may.

In some cases, such as in courts, &c., where a number of small houses stand close together, the whole are supplied by a single pipe and cock, common to all, which is allowed to run during a certain period every day.

The supply for extinguishing fires, so frequent, and often so destructive, in London, forms an important part of the duties of the water companies, and every provision is made to insure the prompt delivery of an abundant quantity of water whenever and wherever a fire breaks out. For this purpose plugs of wood, called *fire plugs,* are inserted into the water mains in the streets, at frequent intervals, and, by knocking out any of these, the water is allowed to gush out in large streams, and can be at once made use of for the fire engines on the spot. The number of fire plugs in the streets of London is nearly 30,000; their situations are legibly marked on the walls of buildings near.

The following summary will exhibit some of the statistics of the waterworks of London for the year 1849[*].

Name of Company.	Cost of Works.	Annual Income from Water Rents, &c.	Number of houses supplied.	Average number of gallons per day.
New River	£1,421,717	£136,296	83,206	14,149,315
East London	745,781	70,585	56,409	8,829,462
Chelsea	455,712	35,917	20,393	3,940,730
West Middlesex	648,560	65,415	24,480	3,334,054
Grand Junction	522,295	43,387	13,858	3,532,013
Lambeth	307,352[†]	22,446	23,396	3,077,260
Southwark and Vauxhall	435,247	36,396	34,217	6,013,716
Kent	202,104[‡]	14,442	9,632	1,079,311
Hampstead	121,231[‡]	7,009	4,490	427,468
Total	£4,859,999	£431,893	270,581	44,383,329

The sources from which the water is taken may be thus classified:—

From the Thames	45 per cent.
From the rivers Lea and Ravensbourne	22 „
From inland sources—Middlesex and Hertfordshire	33 „
	100

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[*] Extracted from the returns made to the Board of Health, and presented to Parliament, 1850.

[†] Excluding the new works.

[‡] Uncertain.

The total quantity of water supplied during the year 1849 was 16,200,000,000 gallons. To give an idea of this immense quantity, it may be stated, that it exceeds the total annual rain-fall of 27 inches over the populated portion of the metropolis (twenty-five square miles) by upwards of 50 per cent., and that it would cover an extent of area equal to that of the city (about one square mile) with upwards of 80 feet depth of water. Its total weight is nearly 72,000,000 tons.

The number of houses supplied with water by the companies is estimated to be about 94 per cent. of the whole number existing. Dividing the daily quantity of water by the number of houses, we have an average supply of 164 gallons per day to each house; and taking the population roughly at 2,000,000, the quantity is 22 gallons per day for each individual. It must be recollected, however, that in the total supply given is included that afforded for other than domestic purposes, such as for trades, manufactories, public baths and washhouses, road-watering, extinguishing fires, flushing sewers, sanitary purposes, &c., which is estimated to amount to about 11 per cent. of the whole.

The rates charged for water are determined by the company supplying, according to the circumstances of each special case; it being very difficult to lay down any general rule like that adopted in the case of gas. *Water-meters* have not yet been introduced; and their adoption in private houses would be objectionable, as it would tend to limit the supply of an element of comfort and health, to the plentiful use of which every encouragement should be afforded. The companies, acting on this principle, make a definite charge per annum to each house, and allow the inmates to use *as much water as they please*, without any restriction, except that it be used for domestic purposes only. The charge varies according to the size of the house, the height to which the water is to be supplied, the number of water-closets, &c.; but as a rough approximation, it may be stated to amount, practically, in London, to about 2½ to 5 per cent. on the rent of the house. When large quantities of water are supplied for manufacturing or other special purposes, the charge is arranged by agreement, and varies from 6*d.* to 2*s.* per 1000 gallons. Supplies for road-watering, charitable, and sanitary purposes, are charged at a very low rate, sometimes at merely a nominal price, and any quantity wanted for extinguishing fires is afforded gratis.

The water supply of London, like most other topics in which the public at large are interested, has from time to time been the subject of popular agitations; sometimes, no doubt, caused by the backwardness of the companies in meeting the pressing demands of the public for improved supplies, but too frequently promoted by speculators or demagogues for their own private ends. In 1821, and about every six years subsequently, parliamentary inquiries have been instituted, and new schemes have from time to time been projected to supply London from the Colne, the Verulam, the Wandle, or the Medway; from the Thames at Maidenhead, Henley, or even above Reading; from Artesian wells; from springs at Watford; and from chalk-cuttings in Kent. But the general result has been only to stimulate the existing companies to increase the quantity and improve the quality of the water they supplied. At present a new crusade is opened against them, headed by the "General Board of Health," who have recommended to Parliament that all the present works and sources be abandoned, and that the metropolis be supplied from the drainage of a tract of land at Bagshot Heath. The present agitation will no doubt answer the wholesome purpose that the others have done, namely, that of keeping the water companies awake to their duties to the public. The attention lately drawn to sanitary matters is beginning to induce a favourable change in the habits and feelings of almost all classes in regard to their domestic arrangements; and one of the first consequences of the progress of cleanliness is a growing demand for an abundance of good water. Let the companies but meet this demand in a liberal spirit, as many of them are now doing, and London will continue to be, as it has always hitherto been, one of the best-supplied cities in the world.

EXCURSIONS TO THE VICINITY OF LONDON.

The neighbourhood of London abounds in the many-varying objects of interest for the instruction and pleasure of the stranger and the native. In previous portions of our Volume we have treated of the subject of "Gardens, Parks, &c." The neighbouring rural districts of London have been so described as to give the reader just conceptions of the many interesting objects of nature and art. The subject of "Galleries of Art," Dulwich, Hampton Court, Windsor, &c., are described for their collections of pictures, &c. In the article on "Observatories," the reader is informed of the several seats of learning in astronomical art immediately around London; and the convenient, although the more distant, seats of learning and science, such as Cambridge, Oxford, &c., are not omitted. Notwithstanding some fair ideas have been given of our vicinity, interspersed in the article above alluded to, we are yet desirous of adding to our task by inducing the stranger, by means of our railways, to visit the following places—particularly gratifying to persons of taste and refinement.

1. By the Great Western, or South Western Railways, station either Paddington or Waterloo Road, Eton, being the nearest to the Slough Station, 20 miles from London, claims our first notice.

Eton is in Buckinghamshire, on the opposite bank of the Thames to Windsor, from which it is only separated by a bridge. Eton is famed for its royal college and school, founded by Henry VI. in 1440, for the support of a provost and seven fellows, and the education of seventy youths in classical learning. It is a handsome building, of the Tudor style of art, and consists of two quadrangles; one appropriated to the school and the lodging of the masters and scholars; the other to the apartments of the provost and fellows. The library is, for its extent, one of the best in England. The chapel is a stately structure, resembling that of King's College, Cambridge. Besides those on the foundation, there are seldom less than 300 noblemen and gentlemen's sons, who board at the masters' houses, or within the bounds of the college. The Eton Montem is a singular custom, which takes place triennially on Whit Tuesday; the ceremony is generally honoured by the attendance of the Royal family and a splendid company; it consists of a procession of all the pupils to a small eminence on the southern side of the Bath road, which has attained the name of Salt Hill, from which spot they disperse themselves to collect donations from all passengers, no one being permitted to pass without giving money for salt. Those collecting it are called salt-bearers, and are arrayed in fancy dresses. The money thus collected amounts to several hundred pounds. It is given to the senior scholar, denominated the captain of the school, for his support at one of the universities. The chapel and college may be seen by application to a person always in attendance.

WINDSOR, a borough town in Berkshire, 22 miles from London, sends two members to Parliament. The Castle, delightfully situated on the summit of the hill, is the royal residence of the sovereigns of England. The following is extracted, by permission, from Sir Jeffry Wyatville's elaborate work on Windsor Castle.

Windsor Castle.—" During 720 years, out of a period of nearly eight centuries which have elapsed since its foundation, Windsor Castle has been distinguished as the most favoured residence of the sovereigns of England."*

Like other places which have attained celebrity, the Castle of Windsor has its fable preceding its history. Tradition has assigned its origin to King Arthur, and assembled here the Knights of the Round Table, attributing to that obscure period those chivalrous associations of the middle ages which led to the establishment of the noble order of knighthood with which Windsor is so inseparably connected.

It was first annexed to the crown by William I., who, being struck with the beauty and convenience of the situation, and its advantage as a station for hunting, erected a castle on the hill, which is represented in the Domesday Book.

Subsequently the Henrys II. and III. added much to the castellated architectural beauty and security of the Castle. In the fourteenth century a total revolution had been effected in the principles of castellated architecture. The spirit of feudal warfare had subsided or was quelled by the increasing power of the monarchy; and though security might still be an important element in constructing the habitations of the nobility, yet it was no longer imperative that it should be purchased at the expense of the comforts and amenities of life. The birth of Edward III. at Windsor seems to have determined his inclination to a site so well adapted to be the seat of royalty. The foundation of the College, and the institution of the Order of the Garter, in the locality which he delighted to honour, led to many very important additions to the Castle. The foundation of the College was the first important proceeding of Edward, and took place in the twenty-second year of his reign, when, by letters patent, in which he calls to mind his baptism in the Castle, he refounded the chapel to the honour of God, the Virgin Mary, St. George, and St. Edward. The Pope's Bull, commending and confirming this pious intention, was issued at Avignon, November 30, 1351, and on the same day in the following year, the statutes bear date by which the Bishop of Winchester, as the Pope's delegate, instituted " The College or Free Chapel of St. George within the

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* Sir Jeffry Wyatville's admirable work, *Windsor Castle.* Large folio, 1841.

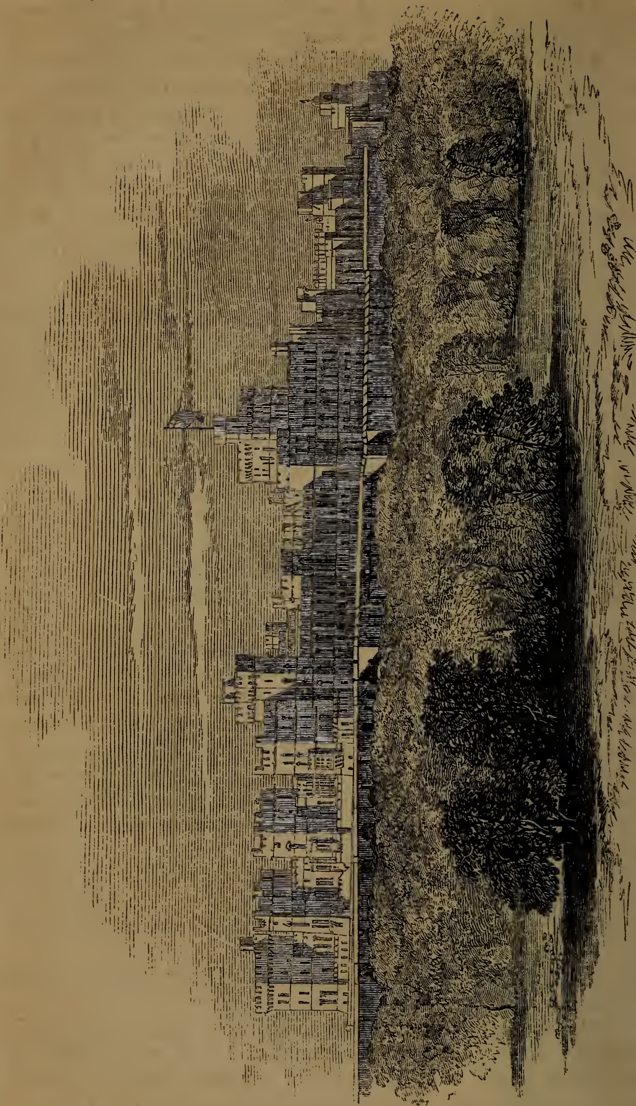
Castle of Windsor." Before the establishment of the College was finally settled, the Order of the Garter had been instituted. This event has been satisfactorily fixed in the year 1349 by Ashmole, who assigns the origin of the order to the ancient association of the Round Table, which Edward revived with solemn jousts and tournaments, with a view of tempting into his service the foreign knights who might attend them. The greater part of the works of Edward III. was executed between 1359 to 1374, but there had been buildings in progress at the Castle at least as early as 1350, and a new chapel, with houses for the custos and canons, was begun very shortly after the first foundation of the College.

The most remarkable incident of the reign of Richard II. is the appointment of the "Father of English Poetry," Geoffrey Chaucer, to the office of Clerk of the Works to St. George's Chapel. His patent, dated in 1390, empowers him to impress carpenters, masons, and other workmen, for the necessary operations to the chapel, and fixes his salary at two shillings per day, with the privilege of employing a deputy. The erection of that splendid monument of English architecture, the existing collegiate chapel of St. George, renders the succeeding reign an important epoch in the history of Windsor (see description, p. 868). Windsor Castle was the residence of both of the Henrys VII. and VIII. The latter selected Windsor for his place of sepulture. In his will he directs that he shall be interred in the choir of the College, "midway between the stalle and the high altar." Under Edward VI. works were begun for bringing a supply of water to the Castle from Blackmore Park near Winkfield. They were continued by Queen Mary, and as the water was conducted from a distance of five miles, the undertaking was one of great labour and cost. A taste for architecture was too expensive to suit a sovereign so calculating and economical as Queen Elizabeth, and few have done less to encourage it. Windsor Castle, nevertheless, owes to her one of its most striking, peculiar, and magnificent features—the terrace. Shortly after 1576 a new gallery also and banqueting-house were erected.

Cromwell resided occasionally at Windsor, and it is but justice to his memory to believe that he prevented waste. He kept together the endowments of the College, and the landed estates were greatly improved in value during his administration.

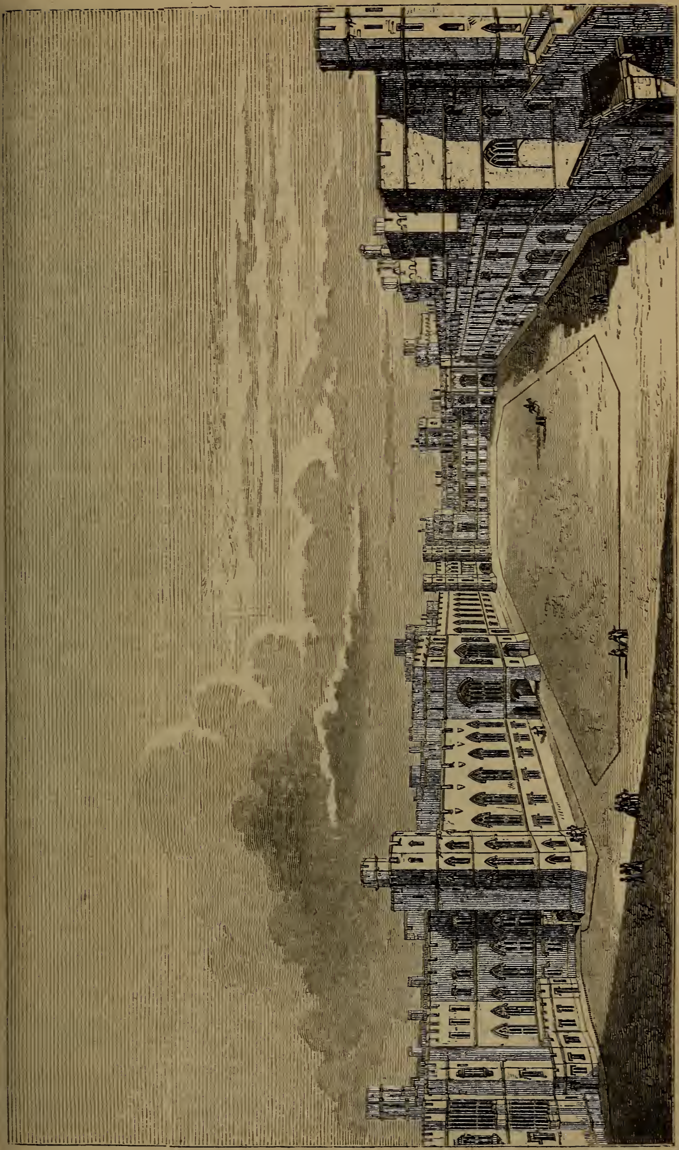
Windsor became the residence of Charles II., and many alterations and repairs were made by Sir Christopher Wren.

St. George's Hall was not completed till some years after the death of Charles. As late as 1701 an account of 1800*l.* was still open with Verrio for his works at Windsor:—for painting the sides and ends of St. George's Hall and repairing the ceiling, 600*l.*; for the altar-piece and sides of the Chapel, and repairing the ceiling, 500*l.*; for the king's privy stairs, 200*l.*; for the stone gallery and guard-chamber staircase, 400*l.*; and 100*l.* for repairing several ceilings: all of which charges Sir C. Wren passed as reasonable.



NORTH-EAST VIEW OF WINDSOR CASTLE.

James II. and William III. did but little for Windsor; also George I. and George II. George III. formed an early attachment to Windsor, but little was done for a long period of his reign. In 1800 Mr. James Wyatt constructed a Gothic staircase, which, subse-



THE QUADRANGLE.

quently, was partly removed, and on the commencement of the reign of George IV. it was to the universal satisfaction of the nation at large that this monarch adopted the Castle as his favourite residence, and announced his desire to extend the repairs and alterations, necessary for his own immediate accommodation, to a thorough and lasting restoration and re-establishment of the whole structure, and that Sir Jeffry Wyatville was appointed to the direction of this great work; and on the 5th of April, 1824, the House of Commons voted, on account of the works at Windsor Castle, the sum of 300,000*l.* A commission of eight noblemen and gentlemen was appointed for the general control of the works. (See following page for plan of the principal story.)

Our space precludes our pointing out the precise alterations and great improvements made by Sir Jeffry Wyatville in the different quarters of the Castle. It is therefore the more desirable on the part of the visitor to make a personal inspection. (See pages 862 and 863.)

Before the late improvements of the Castle under the direction of Sir Jeffry Wyatville, no part of the royal palace or domain was so totally inadequate to the uses of the royal residents as the stables, which were at that time situated at two different parts of the town of Windsor, and were in no respects better, but much more dilapidated, than those of an ordinary country inn; but although the accommodation was of the worst description, the cost of maintaining them, and of the many temporary buildings in connection with them, which were obliged from time to time to be erected, was very considerable. George IV. always intended that a new mews on the site of the present building should form part of his projected improvements, and had he lived, there is no doubt, from his love of fine horses and royal display, that the mews would have been built in a style and at a cost only inferior to the Castle itself. In order, however, to screen his projected stables from view from the windows in the south front of the Castle, he caused a considerable part of the rubbish which had accumulated in the alterations at the Castle to be thrown up as an

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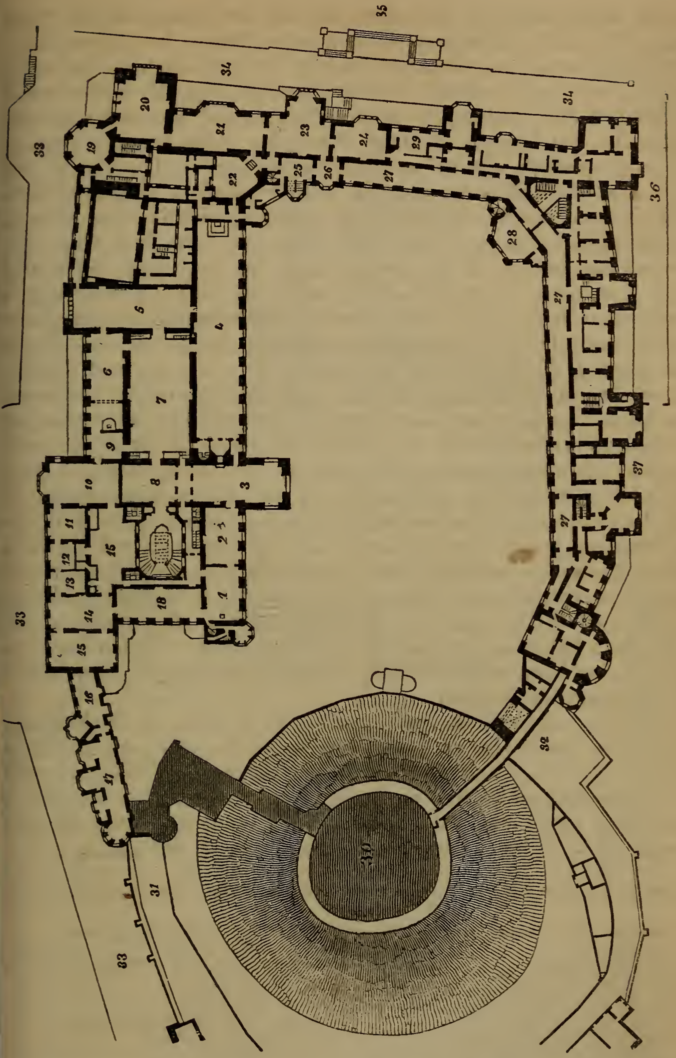
Explanation of the References in the Plan of the Principal Story of Windsor Castle. The Upper Ward.

1. The Queen's audience chamber.
2. The Queen's presence chamber.
3. The guard chamber.
4. St. George's hall.
5. The ball room.
6. The throne room.
7. The Waterloo chamber.
8. The grand vestibule.
9. Ante-room.
10. The King's state drawing room. (Rubens' room.)
11. The council room.
12. The King's closet.
13. The Queen's closet.
14. The Queen's state drawing room.
15. King Charles the Second's room. (Library.)
16. King Henry the Seventh's room. (Library.)
17. Queen Elizabeth's room. (Library.)
18. The old ball room. (Vandyke room.)
19. Waiting room.
20. Dining room.
21. Saloon.
22. Private chapel.
23. Drawing room.
24. Breakfast room.
25. Visitors' stairs.
26. Ante-room.
27, 27, 27. The long gallery.
28. The oak breakfast room.
29. From 29 southwards, and along the south front, are the private apartments.
30. Round tower.
31. Queen Elizabeth's gateway.
32. St. George's gateway.
33. The north terrace.
34. The east terrace.
35. The sunk garden.
36. The Victoria tower.
37. King George the Fourth's gateway.

For the description of the pictures and works of art in the Castle, see article "Galleries," (pages 441 to 444); and for directions for admission, see page 441.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PLAN OF THE PRINCIPAL STORY OF WINDSOR CASTLE.

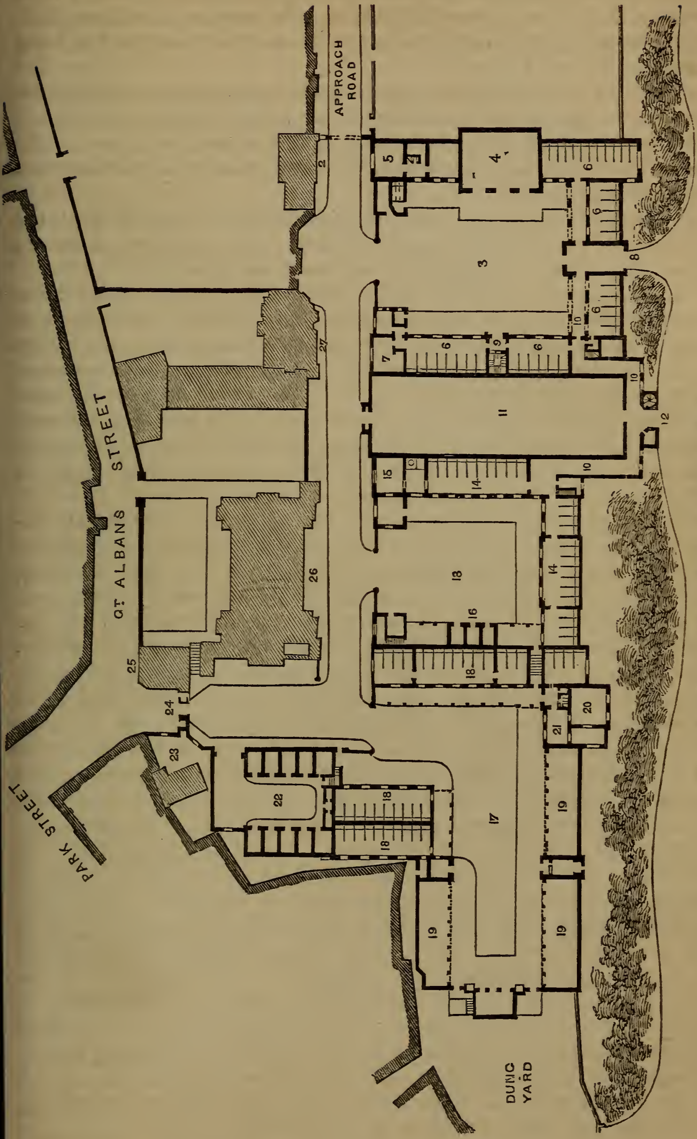
artificial mound, as is the case with the mews at Buckingham Palace. In the reign of William IV. stables were designed suitable for the King and Queen, whose establishments were quite distinct and separate, each having a master of the horse at its head. But as these were not begun during the lifetime of his late Majesty, and as the erection of new mews could be no longer put off, the present stables were designed for the establishment of her present Majesty in the year 1839, when Parliament voted the sum of 70,000*l.* for their erection, that being their estimated cost; and it is worthy of remark that that sum was not exceeded by Mr. Ashton, the architect who carried this work into execution after the death of Sir Jeffry Wyatville. (See opposite page.)

It may perhaps appear to some, on looking at the plan of the mews, that the stables are wanting in that grandeur of arrangement which is produced by bringing large masses of building into view at one coup-d'œil, but such was quite impossible here, both from the extreme narrowness of the ground and the rapid slope of it, the upper part being as much as 32 ft. above the lower, which made it necessary to arrange the stables on successive platforms; this, however, is found to be an advantage practically, rather than an evil, as each court with its surrounding building is a separate and distinct part of the establishment. At the same time it must be confessed that great ingenuity has been shown by the architect in overcoming the difficulties arising from so great an inequality of level. Beyond, however, the arrangement of the plan of the mews, which is most admirably adapted, the architecture of the stables seems rather to have been dictated by a determination not to exceed the sum of the parliamentary grant, than by a desire on his part to extend his well-earned reputation; and they have accordingly been made so plain and devoid of any architectural decoration as scarcely to escape the charge of baldness; at the same time the interior of the riding-house, which might, by a handsome open-work roof, have been effective and picturesque, has been sacrificed to the economy of obtaining dormitories for the grooms in the roof.

It will be observed in these stables, as in those at Buckingham Palace, that the display of a large number of horses in one stable, as is the case generally in the large stables abroad, have, with the exception of the state-horse stables at Buckingham Palace, been avoided, a peculiarity which has been adopted from motives arising out of a consideration of the essentials to high condition in the horses.

Explanation of the References figured in the Plan of the Royal Mews, Windsor Castle.

1. The approach road from the Castle Hill to the mews.
2. The porter's lodge.
3. The upper or pony court.
4. The coach house for the Queen's carriages.
5. Harness room, with cleaning room adjoining.
6. Pony stable of 12 stalls, and two of 6 stalls; saddle-horse stables of 6 and 8 stalls.
7. Saddle room, with cleaning and boiling room adjoining.
8. The royal entrance to the mews.
9. Stairs to dormitory over the riding house.
10. Descending covered way.
11. Riding house.
12. Entrance to the riding house, staircase to the Queen's gallery, and equerries' waiting room.
13. The middle or saddle-horse court.
14. Stables for 25 horses.
15. Saddle room, with cleaning and boiling room adjoining.
16. Three loose boxes.
17. Coach-horse court.
18. Stables for 39 roadsters and hacks.
19. Standings for carriages.
20. Harness rooms.
21. Harness cleaning room.
22. Loose box court, with 10 loose boxes.
23. A veterinary forge.
24. The town gate of the royal mews.
25. The lodge and coachmen's dwellings.
26. The stablemen's dwelling, mess room &c.
27. The residence of the clerk of the stables.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PARK STREET
DUNG YARD
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PLAN OF THE ROYAL MEWS, WINDSOR CASTLE.

The mews is divided into four courts; the upper, called the pony court, contains the ponies, the Queen's saddle-horses, and carriages.

The next, the saddle-horse court, contains the horses of his Royal Highness Prince Albert.

The third, or coach-horse court, contains the roadsters and the coach horses; and the lowest, or court of loose boxes, near to which is the veterinary surgeon's apartments and the veterinary forge. The number of stalls, including the loose boxes, is 112, and of standings for carriages about 40.

There is a peculiarity in these mews worthy of notice, which is the total absence of the wives and children of the stablemen, who are placed in separate buildings with no access to the mews.

The large building, No. 20 on the Plan, opposite the saddle-horse court, contains the dwelling-rooms of the married stablemen and their families, and there is no connection whatever between that part of the building which is beyond the lodge and the mess rooms, and other rooms used by the single men, on the ground floor of the same building, which is entered from the mews. This building, formerly well known as the lower lodge, was originally a family mansion of the Dukes of St. Alban's, and in more recent times was used as a residence for the younger members of the Royal family.

The royal mews is open to public inspection on application to the resident clerk of the stables at his dwelling near the upper lodge.

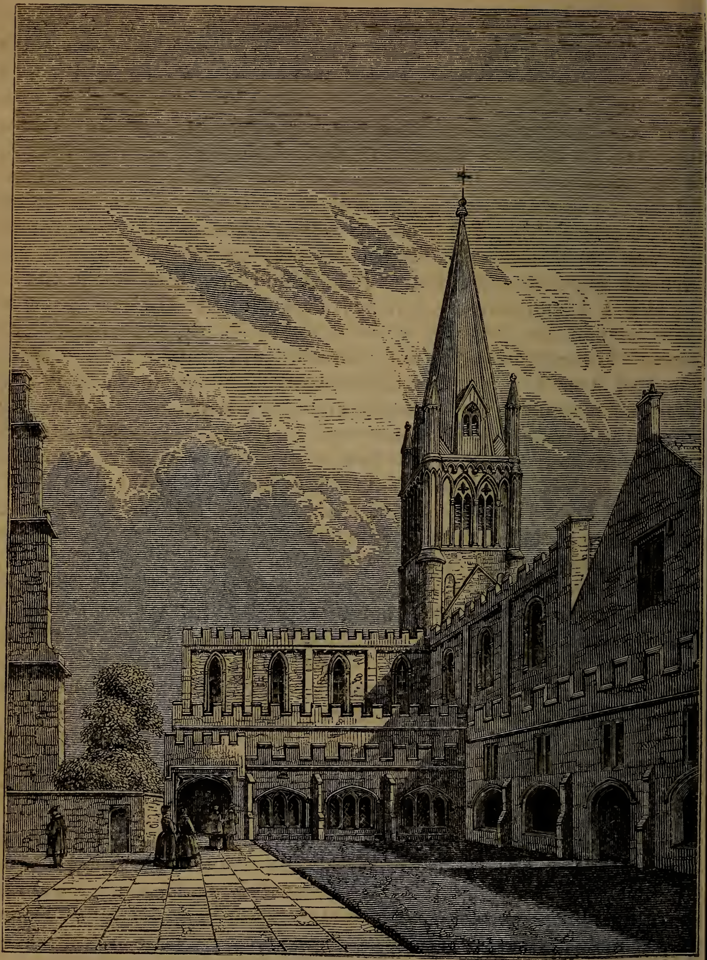
St. George's Chapel, Windsor.—The collegiate chapel of St. George, at Windsor, is the largest in dimensions, the most chaste and elegant in architectural style and character, and the most diversified in external and internal arrangements, of the three royal chapels in England. This noble chapel is of different periods of Gothic architecture. King Henry I. is said to have erected the original chapel within the precincts of Windsor Castle, for eight canons, and to have dedicated it to King Edward the Confessor. Edward III. re-founded the chapel. It was afterwards either rebuilt or enlarged. A commission was issued to Walter de Grey, Archbishop of York, to expedite the work, by keeping the labourers constantly employed both in winter and summer, till the whole was completed. A part of the building then erected is presumed to be now remaining, as a series of closed arches, of the style of that age, is seen on the south side of the Dean's cloisters, and some others remain against the wall behind the altar, at the east end of the present chapel. The interior of St. George's Chapel is very magnificent. The groining of the roof, the vaulting of the nave, choir, aisles, and transepts, is justly an object of admiration, and is distinguished by its elegant forms and numerous ramifications. The interior of the choir is very splendid, having the banners, &c., of the several Knights of the Garter. The splendid stained-glass great west window has recently been restored*, and is an object of much interest. The exterior is a

* Weale's *Divers Works of Early Masters.* 2 vols. folio.

very fine example of Gothic architecture. Several of the early monarchs, among them Henry VIII., lie buried in the vaulted chambers beneath; the most recent are those of George IV. and William IV.

Very extensive alterations are being carried out at the present time in the parks and roads in the immediate neighbourhood of Windsor Castle, by the Commissioners of her Majesty's Woods, &c., under the powers of an Act of Parliament passed in 1848. The old approach from Datchet to Windsor was by a circuitous road, winding for some distance by the side of the Thames, and then passing between the Home Park and Frogmore, to the end of the Long Walk, where it joined Park Street. This road being objectionable, not only on account of its length, but also that it separated Frogmore and the Royal Gardens from the Private Park, and passed over a very old bridge, scarcely in a safe state, it was determined to make a new road, passing in a more direct line to the north of the Castle, and to remove the old road. This alteration further necessitated the construction of a new road to connect Datchet with Old Windsor, and Old Windsor with Windsor itself, by two new cast-iron bridges, of a character in accordance with the Castle, and spanning the river in one arch of 120 ft. It will be observed that the roads, as now laid out, form a complete circuit, enclosing a considerable space, having the Castle within it. The greater portion of this space is now to be devoted to the enjoyment of the Sovereign, who has been graciously pleased to give up for the use of the public the whole of that portion of what was before the Home or Private Park, situated between the new road to the north of the Castle and the River Thames.

In connection with the Windsor improvements may be mentioned the extension of the Great Western and South Western Railways into the town. The former by a branch, about 3 miles long, from Slough, which crosses the Thames by a fine bridge, on the bow-string principle, just above the Brocas, or Eton Playing Fields, and terminates at George Street, Windsor; while the latter leaves the Datchet Station, crosses the river at Blackpotts, not far from old Isaac Walton's fishing-box, traverses the margin of the Home Park, and terminates in Datchet Lane, very close to Windsor Bridge. (For an account of the park and grounds about Windsor, see article "Gardens," &c.)



OXFORD CATHEDRAL.

THE UNIVERSITIES OF OXFORD AND CAMBRIDGE.

Oxford, by the Great Western Railway; Cambridge, by the Eastern Counties Railway—Station, Shoreditch.

On visiting these noble institutions of learning, it is impossible not to be struck with a deep feeling of veneration, on finding ourselves standing amidst these ancient seminaries—the schools from which, for centuries past, have emanated those master minds which, either as statesmen, divines, or lawyers, have contributed to raise this kingdom to its present proud and unrivalled pre-eminence. It must be with gratified feelings that an Englishman contemplates these vast piles, erected and supported by the munificence of their founders and benefactors, his forefathers, whose noble endowments furnish both opportunity and means for the poorest scholar to qualify himself for and attain to the most distinguished positions in society. There is always a feeling of seriousness and solemnity attached to the contemplation of distinguished individuals; an impression deeply increased when treading the very ground where the eminent characters have existed, or the memorable events that have occurred. Who, on visiting Oxford, when viewing that magnificent structure, Christchurch College, can prevent his thoughts reverting to the great and unfortunate minister of Henry VIII., Cardinal Wolsey, his pomp, his magnificence, his lamentable end. With what interest we look up to the window of that room in Pembroke College, where formerly sat the "great leviathan of literature" Samuel Johnson. When at Cambridge, who but must experience a deep interest on visiting the college at which that illustrious statesman William Pitt pursued his academical studies. When passing through Trinity College, we dwell on the mighty mind of Newton, on the unhappy fate of Essex: at this College also the names of Coke, of Bacon, Dryden, Cowley, Byron, and a host of other distinguished characters, crowd upon the memory. In the Fellows' Garden of Christ's College the very tree planted by the hand of the immortal Milton is still in existence. On this classic ground not a college, not a court, but conjures up the reminiscence of some great statesman, some eminent divine, some distinguished poet, all long departed to that bourne from whence no traveller returns.

The Universities of Oxford and Cambridge are "Societies of Students, devoted to the study of learning and knowledge, and for the better service of the Church and State." Each is a corporate body known by the title of *The Chancellor, Masters, and Scholars of the University* by statutes of Queen Elizabeth, sanctioned by Parliament with all their ancient privileges confirmed. The origin of the Universities as seats of learning is involved in much obscurity, and is of very ancient date. Originally the students formed small societies, occupying a variety of tenements, under the names of Inns, Halls, Hostells, &c.; the Colleges, which are incorporated bodies, were not commenced till the thirteenth century. The colleges have considerable revenues, arising from the endowments of their founders and subsequent benefactions, out of which the members on the foundation receive an income and the expenses of the college are paid. Every college has a principal or governor, under the various titles of dean, principal, president, provost, rector, warden, or master, assisted in his government by officers chosen from the senior members on the foundation. Each college possesses statutes for its own government, but all are controlled by the paramount laws of the University. Members of a college on the foundation are termed dependent members, receiving their lodging and commons free; those not on the foundation independent members, and reside entirely at their own expense.

Prayers are read in the chapels of the colleges twice a day, and every member is required to attend a certain number of services weekly, or he is subject to some penalty. Each college has its hall, or refectory, in which the whole of the members are expected to dine at a stated hour; the neglect of attendance subjecting the absentee to some penalty also. At a certain hour every night the college gates are closed, at which time all junior members are required to be in; non-compliance with this regulation incurs a risk of reproof, or punishment by task or fine*. Certain officers (proctors) are appointed to attend to the discipline and morals of the students. Slight offences are punished by reproof, tasks, fines, or temporary confinement within the gates; more grave offences by rustication (sent for a time from college), sometimes by expulsion—a sentence attended with very serious consequences.

Members of the University, before taking a degree, are called under-graduates; the first degree taken is that of Bachelor of Arts, to obtain which it is required to reside a certain number of terms, and to pass two examinations; the first commonly called the "little go." Those incapable of passing their examination are said to be "plucked."

The head of the University is the chancellor (an appointment of great honour), who by the statutes is the supreme governor; next in rank is the high steward; neither of these officers, however, appear but on very particular occasions. The vice-chancellor acts for the chancellor, and, in conjunction with other officers appointed, conducts the government of the University.

All members of the Universities wear the academic costume, varying according to the grades of the members and the faculties in which degrees have been taken.

OXFORD.

The first impression on entering Oxford from the London road† is most striking; the combination of the bridge over which we enter, with the Botanic Gardens to the left, and Magdalen College, the splendid pile on the right, with its lofty and elegant tower, surrounded by the most magnificent trees, produces a whole that at once astonishes and captivates the beholder. The impression excited by this first burst on the beauties of Oxford, is fully kept up during the whole progress up the High Street, every step producing some fresh and interesting feature, with such peeps up the streets to the right and left of noble structures, as to make the visitor impatient

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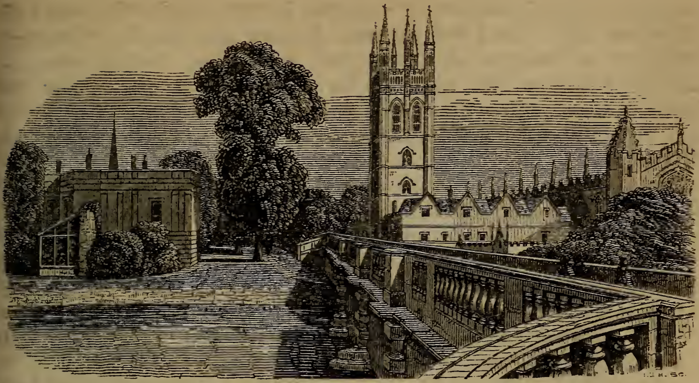
* Many students reside in private lodgings, but they are in no respect exempted from college discipline; none but privileged persons, under certain restrictions, being allowed to let rooms to the students.

† The London coach road.



MAGDALEN COLLEGE.

to commence his work of examination. Mr. Dallaway justly remarks, on speaking of Oxford, that, "for variety and magnificence of public buildings, no city in Europe can offer a competition."

The city of Oxford contains 19 colleges, 5 halls, numerous public buildings and institutions, 16 churches, independent of dissenting places of worship. Taking the colleges in chronological order, they are as follows:—

University College.—Considerable doubt exists as to the precise date of the original foundation of this school; it is stated to be so far back as the time of King Alfred, 872. It is, however, certain that William of Durham, who died in 1249, left considerable property for the endowment of this college, and may be considered as its founder. The present foundation consists of a master, 13 fellows, 16 scholars, &c., with the patronage of 10 livings.

Balliol College.—Founded by John Balliol (father of John Balliol, King of Scotland) and Dervorguilla his wife, between the years 1263 and 1268. The present foundation consists of a master, 12 fellows, and 14 scholars. It has the patronage of 17 livings.

Merton College.—Founded by Walter de Merton, Bishop of Rochester and Lord High Chancellor of England, in 1274. It is to the founder of this college that the present system of having all the students of a college together and placed under the superintendence of tutors and governors is attributed. Before his time they were distributed in insulated houses, inns, hostells, &c. Merton may be considered the primary model of all the collegiate bodies in Oxford and Cambridge, the statutes of Walter de Merton having been more or less copied by all other founders. The foundation consists of a warden, 24 fellows, 14 postmasters, 4 scholars, 2 chaplains, and 2 clerks. It has the patronage of 17 livings.

Exeter College.—Founded by Walter Stapledon, Bishop of Exeter and Lord High Treasurer of England, in 1314, under the name of Stapledon Hall. In 1404 Edmund Stafford, also Bishop of Exeter, added 2 fellowships to the original foundation, besides extending the buildings, and obtained leave to give to the college its present name. The foundation consists of a rector, 25 fellows, and 20 scholarships and exhibitioners. It has the patronage of 14 livings.

Oriel College.—Founded in 1326 by King Edward II. The society consists of a provost, 18 fellows, with 24 scholars and exhibitioners. It has the patronage of 13 livings.

Queen's College.—Founded in 1340 by Robert Eglesfield, Chaplain and Confessor to Queen Philippa (consort of Edward III.), from whom it takes the name of Queen's College. The present foundation consists of 24 fellows, eight taberders, and 20 scholars and exhibitioners. It has the patronage of 27 livings.

New College.—Founded in 1386 by William of Wykeham, Bishop of Winchester and Lord High Chancellor of England. The foundation consists of a warden, 70 fellows and scholars, 10 chaplains, besides clerks and choristers. Wykeham also founded a subsidiary college at Winchester, in 1387, from whence the vacancies in New College are filled up. It has the patronage of 36 livings.

Lincoln College.—Founded in 1427 by Richard Fleming, Bishop of Lincoln. The foundation consists of a rector, 12 fellows, and 21 scholars and exhibitioners. It has the patronage of 10 livings.

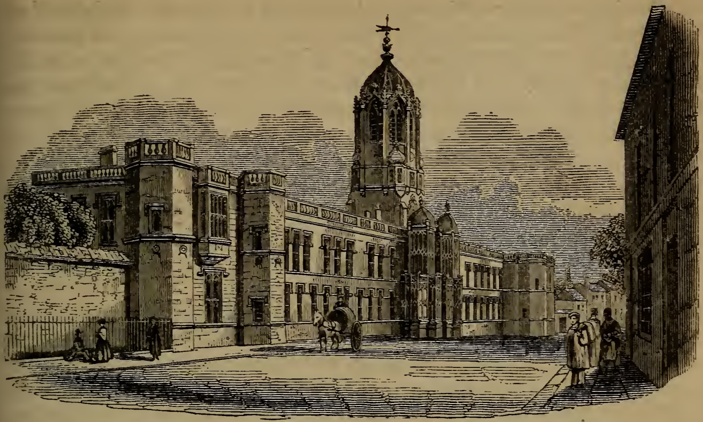
All Souls' College.—Founded by Henry Chichely, Archbishop of Canterbury, in 1437. The foundation consists of a warden, 40 fellows, 2 chaplains, &c. It has the patronage of 17 livings.

Magdalen College.—Founded in 1457 by William of Waynfleet, Bishop of Winchester and Lord High Chancellor of England, on the site of the Hospital of St. John the Baptist. The foundation consists of a president, 40 fellows, 30 scholars (called Demies), 4 chaplains, together with clerks, choristers, &c. It has the patronage of 36 livings. The site of Magdalen College, with its grounds and gardens, covers a space of about 100 acres, the buildings alone occupying nearly 11; its endowments are princely.

Brazenose College, or *The King's Hall and Brazenose College.*—Founded jointly by William Smyth, Bishop of Lincoln, and Sir Richard Sutton, Knt., of Prestbury, Cheshire. The foundation consists of a principal, 20 fellows, and 47 scholars and exhibitioners. It has the patronage of upwards of 40 livings.

Corpus Christi College.—Founded in 1516 by Richard Foy, Bishop of Winchester and Lord Privy Seal. The foundation consists of a president, 20 fellows, 20 scholars, 2 chaplains, and 4 exhibitioners. It has the patronage of 22 livings.

Christ Church College.—Cardinal Wolsey, in 1525, obtained permission to appropriate the revenues of a number of suppressed religious houses to the foundation of this college, and may therefore justly



CHRISTCHURCH COLLEGE.

be considered its founder; although, after making considerable progress with the buildings, it was suppressed, and the revenues seized on by Henry VIII., with whom the Cardinal had fallen into disgrace. In 1532 the King re-founded the college on the same site, with a liberal endowment, in the name of *King Henry the Eighth's College.* In 1545 he again suppressed this college, taking its possessions into his hands; and it was not till 1546 that it was finally re-established in the mixed form of a cathedral and academic college, in which state it still continues. The foundation of Christ Church consists of a dean, 8 canons, 8 chaplains, 101 students, besides singing men, choristers, &c. It has the patronage of about 90 livings.

Trinity College.—Founded in 1554 by Sir Thomas Pope, Knt., of Tenterhanger, in Hertfordshire. The present foundation consists of a president, 12 fellows, 13 scholars, and 3 exhibitioners. It has the patronage of 10 livings.

St. John's College.—Founded by Sir Thomas White, Knt., Alderman of London, in 1555; re-founded by the same, 1557. The foundation consists of a president, 50 fellows and scholars, one chaplain, besides singing men, choristers, &c. It has the patronage of 30 livings.

Jesus College.—Founded by Queen Elizabeth, in 1571, on the petition of Hugh Price, LL.D. The society at present consists of a principal, 19 fellows, and 18 scholars. It has the patronage of 20 livings.

Wadham College.—Founded 1613, in pursuance of the will of Nicholas Wadham, Esq., of Edge and Merefield, Somersetshire, by Dorothy, his widow. The foundation consists of a warden, 15 fellows, 15 scholars, 2 chaplains, 2 clerks, and various exhibitioners. It has the patronage of 10 livings.

Pembroke College.—Founded in 1624 by Thomas Tesdale, Esq., and Richard Wightwick, B.D., Rector of Ilsby, Berks. It takes its name from Philip Herbert, Earl of Pembroke, Chancellor of the University at the time of the foundation of the college. The foundation consists of a master, 20 fellows, and 16 scholars, besides several exhibitioners. It has the patronage of 10 livings.

Worcester College.—Founded in 1714 by Sir Thomas Cookes, Bart., of Bentley, in Worcestershire. The foundation at present consists of a provost, 21 fellows, 16 scholars, and three exhibitioners. It has the patronage of 9 livings.

HALLS.

The difference between the Halls and Colleges is that the former are not incorporated, and consequently the estates and other property they possess are held in trust by the University for their use. In other respects they enjoy the same privileges as the members of the colleges. In former times the halls were very numerous; in the time of Edward I. they are said to have been nearly 300. As the number of colleges increased, that of the halls became less, several halls being comprehended in one college; many have been turned into private residences, till at the present time but five remain. The records of halls being extremely defective, and our limits not being sufficient for entering into any details of their foundations, we only give the names of the five existing halls; taking these societies generally to consist of a principal, vice-principal, with a few scholarships and exhibitioners. With the exception of Magdalen Hall, which possesses one benefice, they have no church patronage.

St. Mary's Hall.

Magdalen Hall.

New Inn Hall.—In the time of the civil war, from 1642 to 1646, this hall was used as a royal mint, to which the different colleges and halls sent their plate to be melted down for the King's use.

St. Alban Hall.

St. Edmund Hall.

In addition to the colleges and halls are the following public institutions:—

Bodleian Library.—Founded in 1602 by Sir Thomas Bodley, Knt., of Exeter.

The Theatre.—Erected at the sole expense of Gilbert Sheldon, Archbishop of Canterbury, and Chancellor of the University, in 1699. Public meetings for the annual commemoration of benefactors, and the recitation of prize compositions, &c., take place in the theatre.

Radcliffe Library.—One of the most striking features in Oxford. Founded by the munificent Dr. Radcliffe; completed 1747.

Radcliffe Observatory.—This building, with a dwelling house attached for the observer, also owes its foundation to Dr. Radcliffe. (See article "Observatories," pp. 674–679.)

Ashmolean Museum.—Erected at the charge of the University, 1683, to receive a collection of natural and artificial curiosities, furnished by Elias Ashmole, Esq., subsequently increased by other benefactors.

The University Press.—Commenced 1826; completed 1830.

The Schools.—This building, which is well worthy of notice, was completed (on the site of the old schools) in the early part of the seventeenth century. It is not the property of any one college, but belongs to the University as a body. Leading out of this square are—

The Picture Gallery.—Containing, besides pictures, many valuable curiosities;

The Arundel Marbles.—Collected by Sir William Petty, for the Earl of Arundel and Surrey; and

The Divinity School.—A large and splendid room, where the exercises for the degrees of Bachelor and Doctor of Divinity are performed.

The Taylor Institution and University Galleries.—Erected from the bequests of Sir Robert Taylor, Knt., and Rev. Dr. Randolph. The former as a foundation for cultivating the European languages; the other for the reception of works of art.

The Martyrs' Memorial.—A very elegant cross, in memory of Cranmer, Ridley, and Latimer, who suffered martyrdom by fire in 1555, on the site of the houses in Broad Street, immediately opposite the Master's house of Balliol College.

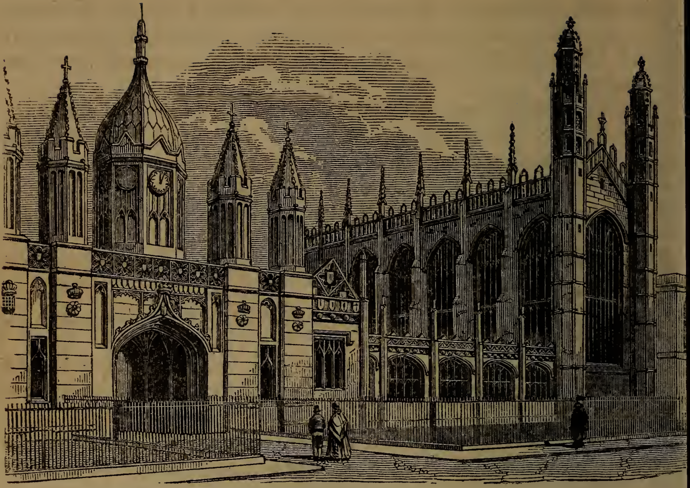
St. Mary's, or *University Church.*—Completed 1498. The tower and octagonal spire is conspicuous from most parts of the town.

The Botanic Gardens.—Founded by the Earl of Danby, 1622. The gardens are extensive, and contain a valuable collection of plants; in the centre walk is a very elegant fountain.

The whole neighbourhood of Oxford abounds with interest. To the Palace of Blenheim, the seat of the Duke of Marlborough, we may particularly draw the attention of the visitor; it is distant only 8 miles from Oxford.

CAMBRIDGE.

The entrance to Cambridge has a far less striking effect than that to Oxford; indeed, although possessing many magnificent edifices, Cambridge must yield the palm to Oxford. The new buildings of St. John's College, however, standing in the midst of their luxuriant grounds, with the more ancient portions of the college adjoining, the new and old bridges crossing the Cam, and the splendid trees, form a whole that produces an effect unsurpassed even at Oxford or elsewhere; and the chapel of King's College stands unrivalled. The view on entering the King's Parade, from Trumpington Street, embraces a vast pile of buildings, and excites perhaps a grander feeling than any single coup-d'œil at Oxford. Cambridge contains



KING'S COLLEGE, CAMBRIDGE.

17 colleges and halls *, besides numerous public buildings and churches. The following is the chronological order of the colleges and halls.

St. Peter's College, or *Peterhouse.*—Founded in 1257 by Hugh de Balsham, Bishop of Ely. The society consists of a master, 14 fellows, and 10 bye-fellows, with about 60 scholars. It has the patronage of 11 benefices and one grammar school.

Clare Hall.—Founded in 1326 by Dr. Richard Badew, in Mill Street, under the title of University Hall. This edifice was destroyed by fire, and rebuilt on its present site, by Elizabeth, sister of the Earl of Clare. This society consists of a master; 10 senior, 9 junior, and 3 bye-fellowships; besides scholars, students, and foundation servants. It has the patronage of 16 benefices.

Pembroke College.—Founded in 1347 by Mary de St. Paul, widow of Aymer de Valence, Earl of Pembroke. Henry VI. was so liberal a benefactor to this College as to be called a second founder. The society consists of a master, 14 foundation and 3 bye-fellowships, 30 scholarships, besides valuable exhibitions. It has the patronage of 10 benefices.

Gonville and *Caius College.*—Founded in 1349 as Gonville Hall, near to St. Botolph's Church, by Edmund Gonville, Rector of Terrington, Norfolk. Established on its present site as Gonville College, in 1353, by William Bateman, Bishop of Norwich. In 1558 Dr. Caius, physician to Queen Mary, procured a new charter, by which it took its present name. The society consists of a master, 29 fellows,

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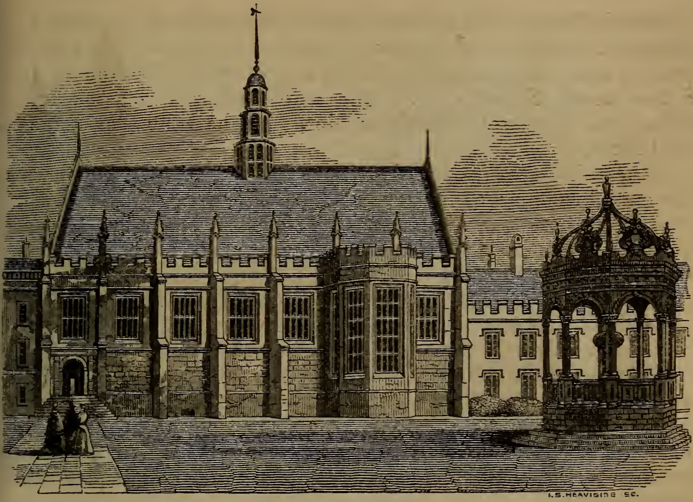
* College and hall, at Cambridge, are almost synonymous.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HALL AND CONDUIT, TRINITY GREAT COURT.

and about 50 scholarships, with numerous exhibitions. It has the patronage of 22 benefices, and the Perse free school.

Trinity Hall.—Founded in 1350 by Bishop Bateman. The society consists of a master, 12 fellows, and 16 scholars. It has the patronage of 8 benefices.

Corpus Christi College.—Founded in 1351 by two societies or guilds in Cambridge. The society consists of a master, 12 fellows, with about 60 scholarships and exhibitions. It has the patronage of 11 benefices.

King's College.—Founded by King Henry VI., 1441. The society of this College consists of a provost, and 70 fellows and scholars. It has the patronage of upwards of 30 benefices. King's College enjoys certain privileges exempting the members from some of the general laws of the University. King's College Chapel is universally celebrated for the beauty and elegance of its architecture.

Queen's College.—Founded in 1446 by Margaret of Anjou, Queen of Henry VI., and re-founded in 1465 by Elizabeth Widville, Queen of Edward IV. The society consists of a president, 20 fellows, and 21 scholars. It has the patronage of 11 benefices.

St. Catherine's Hall.—Founded in 1473, by Robert Wodelarke, D.D., Provost of King's College and Chancellor of the University. The society consists of a master, 14 fellows, and 43 scholars. It has the patronage of 4 benefices, and 1 grammar school.

Jesus College.—Founded in 1496 by John Alcock, Bishop of Ely. The society consists of a master, 19 fellows, and 46 scholars. It has the patronage of 16 benefices.

Christ's College.—This College dates its foundation from 1505, by Margaret, Countess of Richmond, mother of Henry VII.; though prior to this period it existed under the title of "God's House," from a foundation of Henry VI. The society consists of a master, 15 fellows, and nearly 90 scholarships. It has the patronage o 18 benefices.

St. John's College.—Founded in 1511 by Margaret, Countess o Richmond, mother of Henry VII., foundress of Christ's College. This society consists of a master, 60 fellows, 114 scholars, besides numerous exhibitions. Forty-six benefices and three grammar schools are in its patronage.

Magdalen College.—Founded in 1519 by Thomas, Baron Audley, of Walden. The society consists of a master, 17 fellows, and 43 scholars. It has the patronage of 6 benefices.

Trinity College.—Founded by King Henry VIII., 1546, and subsequently augmented by his daughter, Queen Mary. The society consists of a master, 60 fellows, and 69 scholars, with valuable exhibitions. It has the patronage of 59 benefices and 3 grammar schools, with the alternate presentation to the mastership of Westminster School.

Emmanuel College.—Founded in 1584 by Sir Walter Mildmay, Chancellor of the Exchequer in the reign of Queen Elizabeth. The society consists of a master, 15 fellows, and 36 scholars, with several exhibitions. It has the patronage of 19 benefices and 3 grammar schools.

Sydney Sussex College.—Founded in 1598 by Lady Frances Sydney, Countess of Sussex. The society consists of a master, 12 fellows, and 26 scholars, with various exhibitions. It has the patronage of 6 benefices.

Downing College.—Founded in 1800 by Sir George Downing, Bart., of Gamlingay Park, Cambridgeshire. The entire buildings of this College are yet unfinished; when complete, the society will consist of a master, 16 fellows, and 6 scholars.

In addition to the Colleges and Halls, the following public buildings and institutions are worthy of notice:—

The Senate House.—An elegant structure of the Corinthian order, completed about 1730. The public business of the University is here transacted.

The University Library.*—This Library contains, in addition to a voluminous collection of books, a rare and valuable collection of manuscripts, and many curious relics of antiquity.

The Schools.—The Divinity School, the Philosophy School, and the School for Civil Law and Physic, with a lecture room for the professors.

The University, or *Pitt Press.*—A handsome structure, more re-

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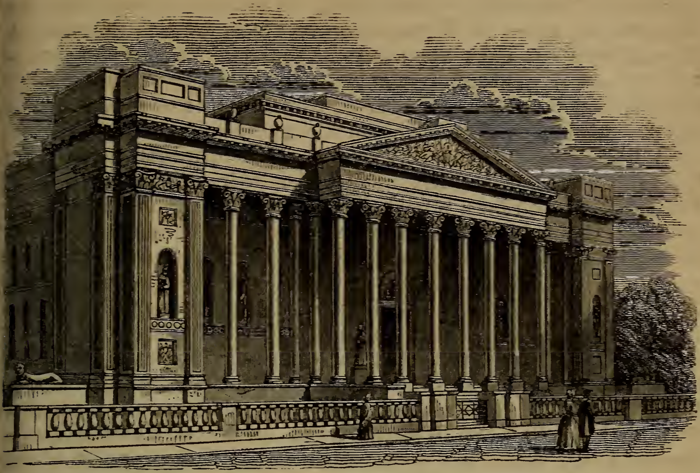
* This library is entitled by act of Parliament to a copy of every work published in this country. The same privilege is accorded to four other libraries.



FITZWILLIAM MUSEUM.

sembling a church than a printing office; so much so, that it goes by the name among the students of the *Freshman's Church.*

The Fitzwilliam Museum.—This magnificent building (architect, the late George Basevi, Esq.), one of the greatest ornaments to Cambridge, owes its origin to the noble bequest of Viscount Fitzwilliam, in 1816. It contains a fine collection of paintings, with valuable drawings and prints; and a choice library, with many valuable manuscripts and illuminated missals. A collection left to the University by Daniel Mesman, Esq., has been added to the Fitzwilliam collection.

Among the numerous churches in Cambridge, two are particularly worthy of notice:—*Great St. Mary's Church*, or the University Church, is of considerable antiquity. Here on Sundays and holidays may be seen the dignitaries of the University in their robes of office, seated on the throne appropriated to them. *Church of the Holy Sepulchre*—one of the four round churches of England, recently restored. This is a very ancient edifice, well worthy the notice of the antiquarian.

We cannot dismiss Cambridge without noticing the College walks, which are really beautiful; and, by the liberality of the heads of the Colleges, being open to the public, form agreeable and healthy spots for exercise to the townspeople. (For Cambridge Observatory, see pp. 670–674.)

ST. ALBAN'S,

A very ancient town, 20 miles north-west of London, by the Great Northern Railway (Station, King's Cross, Battle Bridge), sends two members to Parliament. It was one of the principal places of the ancient Britons, before the Roman Conquest; soon after, it was raised to the rank of a city under the name of Verulam. The greater part of this city was demolished by the Britons, under Queen Boadicea, in the sixty-first year after the birth of Christ; but it was soon rebuilt, and the inhabitants continued under the protection of the Romans for a long time. In the persecution of the Christians under the Roman Emperor, Diocletian, in the year 304, Alban, a native of Verulam, who had been a soldier at Rome, suffered martyrdom for his faith; and being the first Briton who had been put to death for his religious opinions, he is called England's first martyr, as St. Stephen is called the proto-martyr of Christianity. St. Alban's Abbey Church was principally erected in the reign of William Rufus, and is in extreme length 606 ft., by 217 ft. at the intersection of the transept; a large part of the original edifice is composed of materials taken from the ruins of the ancient Verulam, consisting chiefly of Roman tile. There are several monuments of illustrious men; that of Duke Humphrey, of Gloucester, the brother of Henry V., discovered within these few years, is curious. This venerable abbey altogether is an object of great interest. It is to be regretted that those individuals possessing enormous wealth in the church, should not be induced to come forward and protect from the ravages of time this gem of antiquity. In the church of St. Michael, hard by, is a magnificently sculptured sitting monument of the great Lord Bacon, executed by Rysbach. For an excellent Guide of St. Alban's, apply at Mr. Langley's, bookseller, in the town.

ASCOT HEATH.

Five miles from Windsor, and about 24 miles from London, long celebrated for its fashionable race, held in the week after Whitsuntide, which lasts five days. Her Majesty and Royal Family usually attend one or two days. The resort on the race-course during the intervals of the race is exceedingly interesting, from being attended by fashionably dressed and beautiful women of high birth.

EPSOM.

Epsom Downs, or Race-Course, is the great attraction in the spring of the year, for horse-racing. The grand time is about the second week in May. It is one of the greatest horse-racing assemblies in the kingdom, and which the nobility liberally patronize; all classes, from the highest to the lowest, are seen co-mingled in the enjoyment of this delightful English sport. It is in Surrey, about 15 miles from London.

CHISWICK.

A village lying between the Thames and Hammersmith, on the western road, about 5 miles from London, remarkable for its horticultural gardens (see article "Gardens," pp. 480–487) and the fine seat and beautiful gardens of the Duke of Devonshire. The house is in the Palladian style, built by the Earl of Burlington. There are two statues, one of Palladio, and the other of Inigo Jones, sculptured by Rysbach. The house contains a few good paintings, and the gardens are under the able direction of Mr. Edmunds (see also pp. 506–508). In this mansion expired the great statesmen, Charles James Fox, in 1806, and George Canning, in 1827. In the parish churchyard are deposited the remains of the Countess of Falconberg, the daughter of Oliver Cromwell; the Earl Macartney; Ralph the historian; Loutherbourg the painter; Hogarth, on whose tomb there is an epitaph written by Garrick; Ugo Foscolo, an Italian literati of eminence.

KEW.

Remarkable for its splendid gardens, and once a royal residence; formerly, also, the residences of the late Duke of Cambridge, and the King of Hanover. (For a description of the gardens, see article "Gardens.")

RICHMOND.

Very beautifully situated, long celebrated for its picturesque and romantic views of rich and cultivated fields, villas, residences of the nobility and gentry, hills and dales, and of the meandering Thames. The views present Petersham, Twickenham, Hampton Court, Windsor, Harrow-on-the-Hill, &c. These views are from Richmond Hill, a spot consecrated by the writings of the poet and the historian. The Star and Garter, an hotel of very fashionable resort, have the choicest repasts for visitors. The late King of the French and his family took up their residence in this hotel several times during their sojourn in this country. Richmond Bridge has from it very pretty views of the Hill, with the studded villas which adorn the banks of the Thames. Close to the bridge is a residence combining with it on either side a conservatory, which, by reference to the article "Gardens," will be found explained.

Within a very short distance looking east there is an iron bridge, on which the railway is carried, and is the route to Twickenham, Windsor, &c.

Richmond Park is very extensive, containing upwards of 2200 acres, and said to be about 8 miles round. Lord John Russell, Prime Minister, has his residence in the great lodge. It is a fine structure, the centre of which is constructed of stone, and the wings of brick. It is on an elevated spot commanding fine prospects; besides other edifices, with gardens, &c.

Richmond was formerly a royal residence. Queen Elizabeth died here March 24, 1604. (See also article "Gardens.")

HAMPTON COURT PALACE.

Hampton Court Palace (see articles "Galleries" and "Gardens," pp. 496–498); a most interesting palatial edifice. (For a view in the gardens, and an exterior of the palace gardens, front, &c., see the two illustrations in the article "Galleries" and "Gardens;" in the latter a description of these gardens will be found.) This palace was originally built by Cardinal Wolsey, and afterwards enlarged and improved by Sir Christopher Wren. It is one of the Royal Palaces, and it is beautifully situated on the banks of the Thames, to which it has a frontage of 328 ft. To this structure there are three grand quadrangles: the western or entrance court is 167 ft. by 141 ft.; the clock court is 133 ft. by 91 ft.; and the eastern or fountain court is 111 ft. by 117 ft. It is in the Tudor style of architecture, and is a very fine example, but with some mixture of a later style. The apartments of the interior contain a numerous collection of pictures particularly rich in portraits by Sir Peter Lely, Sir Godfrey Kneller, &c., and there are also the celebrated cartoons of Raphael. The rooms are capacious, and very suitable for the exhibition of pictures. In one of the apartments there is an extraordinary fine model made in Indian wood—the palace of one of the rich Hindoo Princes, at Moorshasabad. This palace was erected by Major General M'Leod, who had the honour of presenting it to her Majesty. A descriptive catalogue of the contents of this fine palace is sold by one of the domestics for 6*d.*

The fine Hall (called Wolsey's Hall) has lately been restored to its pristine beauty, and is shown to visitors. It is a noble specimen of a princely and baronial hall, upwards of 100 ft. by 40 ft. in width. Annexed is the ancient withdrawing-room or presence chamber, of about 60 ft. long, being an equal breadth to the hall. The ceiling is most splendid, with pendent ornaments and rich carvings, and the windows are of equal splendour, with stained glass.

The visitor should not omit an inspection of this splendid grandeur of the Tudor period. The town of Hampton affords every accommodation for the visitor's comforts. Opposite the palace gates are the fine gates of the entrance to Bushy Park, which should be visited for the beauty of the stately trees.

CLAREMONT.

Claremont Palace (west of London, in the county of Surrey), so much known; becoming an object of historical and mournful interest from being the residence of the late Princess Charlotte of Wales, only child of George IV., and first wife to the King of the Belgians, when Prince Leopold of Saxe Cobourg; subsequently the residence of the late dethroned monarch of France, Louis Philippe; and now that of his Queen and royal family. Its situation is near the village of Esher in Surrey, 17 miles from London. The present palace was built about 80 years since for Lord Clive, who spent upwards of 100,000*l.* in its erection and decoration. It was in 1816 purchased by parliament, at a cost of 65,000*l.*, as a residence for Prince Leopold, who now nominally occupies and maintains it as a residence for the family of the fallen monarch. (See also p. 506.)

INDEX AND DIRECTORY.

THE following Index and Directory includes not only the objects mentioned in the work, but, for the convenience of the stranger, every leading street and public office, with an indication of the address, or of the locality referred to on the map. The following abbreviations are used: bdgs., buildings; rd., road; sq., square; st., street; St., Saint; N., E., W., S., north, east, west, and south. To express the part of a street in which the object indicated is situated, the number of the house is given before the name of the street; the number of the page, if there is any reference in the book, after the name of the street.

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